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2021 Research Symposium: International Conference on Cancer Health Disparities (ICCHD-2021)

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2021 Research Symposium

International Conference on Cancer Health Disparities (ICCHD-2021)

Participants posing for a picture with Dean Hocker on Day 1 & 2 of the 2021 UTRGV Research Symposium, International Conference on Cancer Health Disparities (ICCHD)

THE UNIVERSITY OF TEXAS RIO GRANDE VALLEY

SCHOOL OF MEDICINE

4th ANNUAL

RESEARCH SYMPOSIUM

INTERNATIONAL CONFERENCE ON CANCER HEALTH DISPARITIES (ICCHD)

August 13 & 14, 2021

Harlingen Convention Center

Harlingen, Texas

Andrew Tsin, Ph.D.

Sr. Associate Dean of Research

Jorge Teniente, MPA

Director of Special Programs

Subhash C. Chauhan, Ph.D.

Chairman, Immunology & Microbiology Department

Murali Yallapu, Ph.D.

Associate Professor, Immunology & Microbiology Department

HARLINGEN CONVENTION CENTER

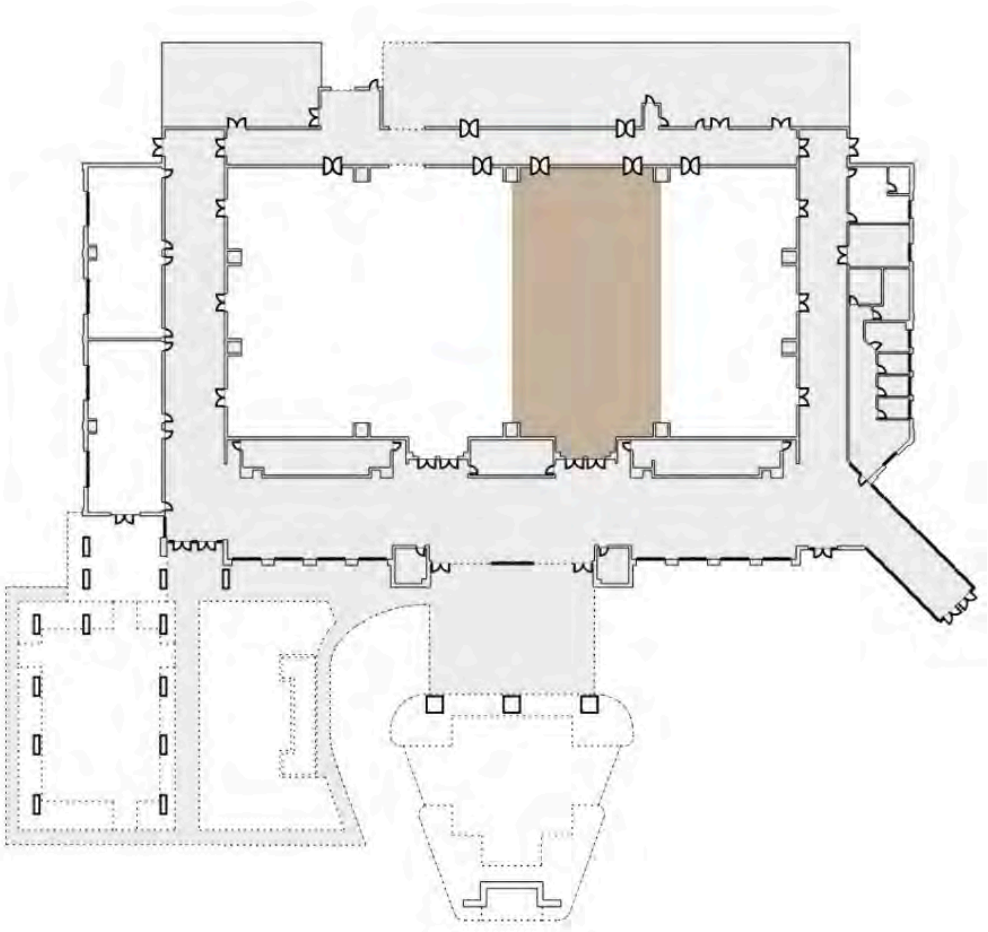

Table of Contents

Event Sponsored by
The Office of the Associate Dean of Research, School of Medicine
The University of Texas Rio Grande Valley

Andrew Tsin, Sr. Associate Dean of Research

Jennifer Cahn, Grant Research Officer

Jorge Teniente, Director of Special Programs

Veronica Vera, Program Manager
Edith Ramos Kolahdouz, Program Coordinator

Aniella Olivarez Perez, Administrative Associate

Event Conducted by
The Department of Immunology & Microbiology and
The South Texas Center of Excellence in Cancer Research, School of Medicine
The University of Texas Rio Grande Valley

Subhash C. Chauhan, Chairman Immunology & Microbiology Department

Murali Yallapu, Associate Professor, Immunology & Microbiology Department

Planning Committees

Dr. Andrew Tsin, Sr. Associate Dean of Research, School of Medicine, UTRGV

Scientific Committee Chair: Dr. Subhash C. Chauhan, Professor & Chairman, Dept. of Immunology & Microbiology, School of Medicine, UTRGV

Event Planning Committee Chair: Jorge L. Teniente, Director of Special Programs, School of Medicine, UTRGV

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Dr. Sheema Khan, Assistant Professor, Dept of Immunology & Microbiology, School of Medicine, UTRGV

Dr. Bilal B. Hafeez, Assistant Professor, Dept of Immunology & Microbiology, School of Medicine, UTRGV

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Dr. Beatriz Bautista, Associate Professor, School of Nursing, UTRGV

Dr. Anupam Dhasmana, Assistant Research Scientist, Dept of Immunology & Microbiology, School of Medicine, UTRGV

Ms. Ana I. Martinez Bulnes, BS, MS Biochemistry Student, UTRGV

Dr. Andrew Tsin, Associate Dean of Research, School of Medicine, UTRGV

Mr. Aaron De La Cruz, Medical Student

Event Planning Committee Members:

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Mr. Loren Clark, Program Manager, Population Health & Biostatistics, School of Medicine, UTRGV

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Dr. Vivek Kashyap, Assistant Research Scientist, Department of Immunology & Microbiology, SOM

Dr. Jay Morrow, Associate Dean of Clinical and Translational Research, School of Medicine, UTRGV

Dr. Paulina Vega, Internal Medicine Resident, Valley Baptist Medical Center

Dr. Heriberto Cantu, Internal Medicine Resident- PGY1, Valley Baptist Medical Center

Ms. Elizabeth Lim, Fourth Year Medical Student

Mr. Matt Hidalgo, Fourth Year Medical Student

Ms. Sonal Jha, Second Year Medical Student

Planning Committees *(continued)*

Finance Committee Members:

Ms. Dorian Garcia, Manager, SOM Finance and Administration, Chair of Finance Planning Committee

Dr. Andrew Tsin, Sr. Associate Dean of Research

Dr. Subash C. Chauhan, Chair, Department of Immunology & Microbiology, and Scientific Program Planning Committee Chair

Dr. Karen Martirosyan, AVP, Office of the EVP for Research, Graduate Studies & New Program Development

Mr. Javier "Jay" Zambrano, AVP for Development

Dr. Manish Tripathi, Faculty, Dept. of Immunology & Microbiology

Mrs. Isabel Nicasio, Co-Chair of Finance Planning Committee

Mr. Jorge L. Teniente, Chair of Event Planning Committee

Dr. Michael B. Hocker, Dean of the University of Texas Rio Grande Valley School of Medicine, assumed his post on June 28, 2021.

Dr. Hocker comes to the Rio Grande Valley from the Medical College of Georgia (MCG) at Augusta University where he served as the senior associate dean and designated institutional official (DIO) of graduate medical education. In that role, Dr. Hocker oversaw 51 residency and fellowship programs. Previously, he served as the Vice-Chair of Operations for Emergency Medicine and assistant DIO for graduate medical education. He also holds the J. Harold Harrison M.D. Distinguished Chair in Emergency Medicine.

Dr. Hocker is a master clinician and Board certified in Emergency Medicine, he completed his internship at the UC Davis East Bay Surgical Program in Oakland, California, and his residency training in emergency medicine at the University of Massachusetts.

A former U.S. Navy flight surgeon, he graduated from Ft. Lewis College in Durango, Colorado and earned his Doctor of Medicine degree from the University of Colorado School of Medicine.

Dr. Hocker and his family are excited about joining the UTRGV community and making South Texas their home, where they will be closer to his mother, Jean, and stepfather, Richard, who currently live in Harlingen.

WELCOME TO THE 4th ANNUAL UTRGV RESEARCH SYMPOSIUM

On behalf of our faculty, staff, and students, I am pleased to welcome you to the UTRGV School of Medicine's Fourth Annual Research Symposium. We are excited to bring this program to the Valley and to showcase the outstanding research done by investigators at the University as well as our national and international partners. The oral and poster presentations that you will experience today are examples of the excellent work that these researchers have completed. They provide an expansion of knowledge in these key disciplines and demonstrate the diligence and commitment of these individuals in their pursuit of science. With the theme of "International Conference on Cancer Health Disparities" this symposium aims to showcase the work done by our researchers from a broad array of disciplines (academia, community, health care) to identify gaps and/or solutions to respond to multi-faceted heath and health disparity issues impacting minority and underserved populations across the Nation and Worldwide.

One of the key missions of a medical school is the sponsorship and conduct of research activities, including basic, translational, and clinical research. It is through research that we engage our students in critical thinking and in enhancing scientific curiosity. Research serves as the basis for evidence on the quality and efficacy of clinical care and for enhancing patient safety. Discoveries made in the laboratories of our basic scientists assist in the understanding of mechanisms in both health and disease and offer the foundation for translating these findings into clinical interventions. Research provides public visibility for a medical school and contributes to its reputation as an institution of higher learning.

It is with these key principles in mind that I once again welcome you to this Research Symposium. Thank you for attending and for participating with us in this important scholarly activity. Please enjoy the day and the program.

Michael B. Hocker, MD, MHS
Dean, School of Medicine

PROGRAM SCHEDULE

FRIDAY AUGUST 13, 2021, HARLINGEN CONVENTION CENTER, Harlingen, TX

3:00-5:00 PM

EARLY CHECK-IN & REGISTRATION

5:00-5:30 PM
BALLROOM D

WELCOME & OPENING REMARKS

DR. SUBHASH C. CHAUHAN, Chairman, Department of Immunology & Microbiology, UTRGV

DR. MICHAEL B. HOCKER, Dean, School of Medicine, UTRGV

HONORABLE CHRISTOPHER BOSWELL, Mayor, City of Harlingen

DR. PARWINDER GREWAL, Executive Vice President, Research, Graduate Studies, & New Program Development, UTRGV

5:30-6:00 PM

PLENARY PRESENTATION *(via Zoom)*

RINA DAS, PHD
NIMHD Mission and Programs in Health Disparities
SESSION MODERATOR: DR. SUBASH C. CHAUHAN

6:00-6:30 PM

KEYNOTE PRESENTATION *(via Live Zoom)*

JOSE A. TORRES RUIZ, PHD
Eliminating Cancer Health Disparities through the PHSU Specialized Center in Health Disparities

6:30-7:00 PM

KEYNOTE PRESENTATION *(via Live Zoom)*

RENU WADHWA, PHD
Experimental evidence to the bioactivities of propolis constituents, Caffeic Acid Phenethyl Ester and Artepillin C

7:00-7:30 PM

PLENARY PRESENTATION
JAMBOOR K. VISHWANATHA, PHD *(in person)*
MIEN1 in regulation of migration and invasion in prostate and breast cancers

Note: Poster viewing will be in **Ballroom E** both days and may be done at each individual's discretion keeping in mind a safe social distance.

SATURDAY AUGUST 14th, HARLINGEN CONVENTION CENTER, Harlingen, TX

7:30-8:00 AM
LOBBY

CHECK-IN & REGISTRATION

8:00-8:10 AM
BALLROOM D

WELCOME/ INTRODUCTION OF SPEAKERS and SESSION MODERATOR

SUBHASH C. CHAUHAN, PHD
SESSION MODERATOR: DR. BILAL B. HAFEEZ

8:10-8:30 AM

SUNIL SAINI, PHD *(via Zoom)*
Multitude of Disparities in Cancer Care in India

8:30-8:50 AM

JUNICHI FUJII, PHD *(via Zoom)*
Genetically modified mice that undergo both oxidative stress and endoplasmic reticulum stress spontaneously develop hepatocellular carcinoma

8:50-9:30 AM

PLENARY PRESENTATION *(via Zoom)*
Daniel G Petereit, MD,FABS, FASTRO
The Walking Forward Cancer Disparity Program: A Model for Community Cancer Control

9:30-9:50 AM

DULAL PANDA, PHD *(via Zoom)*
Inhibition of WNt/B-Catenin Signaling as a Prominent Antitumor Activity of Microtubule-Targeting Anticancer Drugs

10:00 AM-12:10 PM

CONCURRENT SESSIONS
SESSION MODERATOR: DR. MANISH TRIPATHI

10:00 AM

KEYNOTE PRESENTATION
KESHAV SINGH, PHD *(in person)*
Mitochondrial Determinants of Cancer Health Disparities

10:30 AM

MEHDI SHAKIBAEI, PHD *(via Zoom)*
Calebin A decreases tumor microenvironment inducing EMT in CRC cells via modulation of NF-kB/Slug axis

10:50 AM

UPENDER MANNE, PHD *(via Zoom)*
Interplay of Molecular Factors and Comorbid Conditions in Cancer Disparities
SESSION MODERATOR: DR. SHEEMA KHAN

11:10 AM

NADEEM ZAFAR, MD *(via Zoom)*
Promoting Healthcare As A Career for Minority Students To Fight Cancer Health Disparity

11:30 AM

EDUARDO LAZCANO-PONCE, MD, PHD *(via Zoom)*
The Epidemiologic Panorama of Cancer in Mexico

11:50 AM

SOM Research Seminar Speaker
HUGO A. BARRERA-SALDAÑA, PHD *(in person)*
Biomaterials for Cellular Programming and Training

10:00 AM-12:10 PM

CONCURRENT SESSIONS
SESSION MODERATOR: DR. SUBHASH GUPTA & DR. AJAIKUMAR KUNNUMAKKARA

CONFERENCE ROOM C

10:00 AM

KEYNOTE PRESENTATION
SUBHASH GUPTA, PHD *(via Zoom)*
UNRAVELLING THE LONG NON-CODING RNA SIGNATURES FOR GALL BLADDER CANCER

10:30 AM

ALOK BHARTI, PHD *(via Zoom)*

Plant-derived homeopathic preparations with anti-cervical cancer and anti-Human papillomavirus activity as alternative to mitigate cancer health disparity

10:50 AM

ANSHIKA ARORA *(via Zoom)*
Association of Nutritional Status with Failure to Complete Planned Treatment in patients with HNSCC- a prospective cohort study in a Tertiary cancer center in Northern India.

11:10 AM

VARSHA GUPTA, PHD *(via Zoom)*

Disparities in Occurrence of Cancer Due to Different Treatment Modalities in Rheumatoid Arthritis Patients

11:30 AM

MR. ERIK STEINFELDER *(via Zoom)*
Biobanking in Cancer Related Research

11:50 AM

AJAIKUMR B. KUNNUMAKKARA, PHD *(via Zoom)*
Health Disparities in Oral Cancer

12:10 -1:00 PM
BALLROOM C

LUNCH & REMARKS BY,
Dr. Michael B. Hocker, Dean,
School of Medicine, UTRGV

1:00-2:00 PM
BALLROOM D

CONCURRENT SESSIONS

SESSION MODERATOR: DR. SUBHASH C. CHAUHAN

1:00 PM

PATTY MOORE (CPRIT) *(via Zoom)*
Overview- CPRIT

1:20 PM

VIJIYAN DHEVAN, PHD *(in person)*
Cancer Disparities in the Lower Rio Grande Valley

1:40 PM

RAKESH KUMAR, PHD *(via Zoom)*
Science and Medicine: A Priceless Journey

1:00-2:00 PM
CONFERENCE ROOM C

CONCURRENT SESSIONS

SESSION MODERATOR: DR. SUBHASH GUPTA & DR. AJAIKUMAR KUNNUMAKKARA

1:00 PM

KEYNOTE PRESENTATION
RAJESH SINGH, PHD *(via Zoom)*
CCR5/CCL5 axis plays an essential role in Liver Cancer Racial Disparity

1:20 PM

CATHERINE H. KASCHULA, PHD *(via Zoom)*
Investigations into the cytotoxic mechanism of the garlic compound ajoene in cancer cells

1:40 PM

SHAILESH SINGH, PHD *(via Zoom)*
Association of CC chemokines with Breast Cancer Disparity

2:00-4:00 PM
BALLROOM D

ORAL FLASH TALKS PRESENTATIONS

SESSION MODERATOR: DR. MURALI YALLAPU

4:15-5:00 PM
BALLROOM D

AWARDS & CLOSING REMARKS
SUBHASH C. CHAUHAN, PHD,
Scientific Committee Chair

SPECIAL THANKS!

Abstract Reviewers

Presentation Judges

Oral Session Moderators

Staff Volunteers

Student Volunteers

Thank you!

On behalf of the 2020-2021 UTRGV SOM Research Symposium scientific and planning committees, we thank each of you who attended the conference. A special thanks to our partners: The Office of the Associate Dean of Research at UTRGV-SOM, Department of Immunology & Microbiology- UTRGV SOM, UTRGV Development Office, The Office of the Executive Vice President for Research, Graduate Studies, and New Program Development, and City of Harlingen.

Funding for this conference was made possible (in part) by 1R13CA254453-01 from the National Cancer Institute. The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention by trade names, commercial practices, or organizations imply endorsement by the U.S. Government.

Thank you to our Exhibitor:

Nikon

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On HEALTHCARE

2021 KEYNOTE & PLENARY SPEAKERS

Rina Das, Ph.D.

Division of Extramural Scientific Programs
Integrative Biological and Behavioral Sciences, National Institute on Minority Health and Health Disparities (NIMHD)

Presentation Title: NIMHD Mission and Programs in Health Disparities

Jose A. Torres Ruiz, Ph.D.

Chancellor-Ponce Health Sciences University in Ponce, Puerto Rico

Presentation Title: Eliminating Cancer Health Disparities through the PHSU Specialized Center in Health Disparities

Renu Wadhwa, Ph.D.

Professor, School of Integrative and Global Majors (SIGMA); University of Tsukuba, Japan

Presentation Title: Experimental evidence to the bioactivities of propolis constituents, Caffeic Acid Phenethyl Ester and Artepillin C

Daniel G Petereit, MD,FABS, FASTRO

Radiation Oncology, Monument Health- Chicago, Illinois

Presentation Title: The Walking Forward Cancer Disparity Program: A Model for Community Cancer Control

Jamboor K. Vishwanatha, Ph.D.

Regents Professor and Vice President
Director, Texas Center for Health Disparities, University of North Texas Health Science Center

Presentation Title: MIEN1 in regulation of migration and invasion in prostate and breast cancers

Keshav K. Singh, Ph.D.

Professor, Department of Genetics, UAB School of Medicine

Presentation Title: Mitochondrial Determinants of Cancer Health Disparities

Subash Chandra Gupta, Ph.D.

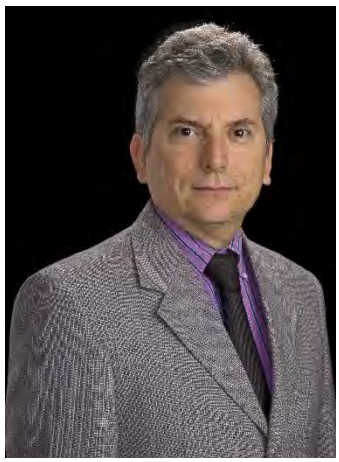
Assistant Professor, Department of Biochemistry- Institute of Science, Banaras Hindu University

Presentation Title: Unravelling the long non-coding RNA signatures for gall bladder cancer

Rajesh Singh, Ph.D.

Associate Professor, Department of Microbiology, Biochemistry, & Immunology Morehouse School of Medicine

Presentation Title: CCR5/CCL5 axis plays an essential role in Liver Cancer Racial Disparity



Hugo A. Barrera- Saldana, Ph.D.

Founder, Center for Genomic Biotechnology of the National Polytechnic Institute and Programs of Higher Education, Research, and Diagnostics at UANL's School of Medicine

Presentation Title: Biomaterials for Cellular Programming and Training

2021 INVITED GUEST SPEAKERS

Sunil Saini, MBBS, MS

Director Cancer Research Institute, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun, India.

Email: sunilsaini@srhu.edu.in

Presentation Title: Multitude of Disparities in Cancer Care in India

Background: Essence of India lies in its diversity which encompasses every sphere of its existence. Diversities which are often seen as strengths of India are also the main source of disparities as well, often affecting health and wellness indices negatively. Much of these disparities continue with some changes in proportions as certain segments of population & habitat move up in the ladder of socioeconomic development. **Methods**: India is host to 1.39 billion multiethnic population living in diverse environments, available natural resources & biodiversity. Cancer incidence & prevalence, stage at diagnosis, mortality and survivorship varies in different geographic and rural, urban areas. There are variable lifestyle and dietary habits, socioeconomic and cultural differences, affordability & access to health care. **Results**: Health information collection & database is improving for all sections of society, although access to modern health care, participation in clinical trials is limited to a select few. 70% rural population having scarce access to limited cancer care facilities concentrated largely in urban India. **Conclusion**: A diverse population like India needs specifically tailored cancer control strategies, taking in account the time, trend, and resources available.

Keywords: Disparities, Cancer, India, Clinical trials & Health information database.

Junichi Fujii, Ph.D.

Professor of Biochemistry & Molecular Biology- Yamagata University

Presentation Title: Genetically modified mice that undergo both oxidative stress and endoplasmic reticulum stress spontaneously develop hepatocellular carcinoma

1.Department of Biochemistry and Molecular Biology, Graduate School of Medical Science, Yamagata University, Japan

2.Department of Pathological Diagnostics, Faculty of Medicine, Yamagata University, Japan.

Background: Non-alcoholic fatty liver disease (NAFLD)is a common chronic liver disease defined as the accumulation of excessive levels of fat in the liver of subjects who have no history of alcohol overdose. When NAFLD patients are exposed to exacerbated injuries, such as oxidative stress and endoplasmic reticulum (ER) stress, their condition advances to nonalcoholic steatohepatitis (NASH), cirrhosis, and, consequently, hepatocellular carcinoma (HCC). However, since no suitable pathological model that reproduces this process is known, the pathological process of HCC development process has not been fully elucidated. **Methods**: We generated Prdx4- and Sod1-double knockout (DKO) mice that are under increased oxidative stress and ER stress. We supplemented the mice with ascorbate (1.5 mg/ml) in drinking water, which is an antioxidant

and promising anti-cancer agent, to see if it helped prevent HCC. **Results**: The DKO mice developed NAFLD followed by NASH spontaneously early in life under conventional breeding conditions. As the result of long-term observation, most DKO mice developed HCC within one year, while the ascorbate-supplemented mice rarely developed HCC. **Conclusion**: NASH is thought to progress to HCC, but it has not been fully validated due to the lack of suitable model animals. Our DKO mice, which undergo oxidative/ER stress, would be useful for clarifying pathogenesis of HCC development initiated by NAFLD.

Dulal Panda, Ph.D.

Chair Professor, Department of Biosciences & Bioengineering, IIT Bombay, Mumbai, 400076

Email: panda@iitb.ac.in

Presentation Title: Inhibition of Wnt/β-Catenin signalling is a prominent antitumor activity of microtubule-targeting anticancer drugs

Dynamic microtubules play essential roles in several cellular processes including chromosome segregation, cell division, cell motility and intracellular transport. Microtubule sare the targets for several clinically successful anticancer drugs such astaxol, estramustine and vinblastine and are also targets for antifungal and antiparasitic agents. In our microtubule-targeted drug discovery program, we have recently identified a small synthetic molecule, C12, having strong anticancer potential (Journal of Medicinal Chemistry 2016, 59:3439-3451; and Biochemical Pharmacology 2019;170:113663). C12strongly inhibited the progression of breast and oral cancer sin mice models. The compound also exerted differential effects on cancer and noncancerous cells. Most recently, we have found that C12inhibits Wnt/β-Catenin signalling in vivo and in vitro(FASEB Journal2021;35(4):e21539). We have performed a series of experiments using vinblastine, taxol and C12to establish that the suppression of Wnt/β-Catenin signalling is a prominent anticancer activity of microtubule-targeting drugs. I will explain our understanding of the mechanism of anticancer action of microtubule targeted drugs and also discuss why microtubule-targeting agents are the most successful drugs among the antimitotic agents.

Mehdi Shakibaei, Ph.D.

Professor - Institute of Anatomy, LMU Munich

Presentation Title: Calebin A decreases tumor microenvironment inducing EMT in CRC cells via modulation of NF-κB/Slug axis

Shakibaei M (1), A Brockmueller (1), C Harsha (2), AB. Kunnumakkara (2), BB. Aggarwal (3)

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(2) Cancer Biology Laboratory & DBT-AIST International Center for Translational and Environmental Research (DAICENTER), Department of Biosciences & Bioengineering, Indian Institute of Technology Guwahati, Assam 781039, India. harsha.choudhary@iitg.ac.in;kunnumakkara@iitg.ac.in
(3) Inflammation Research Center, San Diego, CA 92126, USA. bbaggarwal@gmail.com

Abstract: Tumor microenvironment (TME) has a pivotal impact on tumor progression, and epithelial-mesenchymal transition (EMT) is an extremely crucial initial event in the metastatic process in colorectal cancer (CRC) that is not yet fully understood. Calebin A (an ingredient in Curcuma longa) has been shown to repress CRC tumor growth. However, whether Calebin A is able to abrogate TME-induced EMT in CRC was investigated based on the underlying pathways. CRC cell lines (HCT116, RKO) were exposed with Calebin A and/or a FAK inhibitor, cytochalasin D (CD) to investigate the action of Calebin A in TME-induced EMT-related tumor progression. TME induced viability, proliferation, and increased invasiveness in 3D-alginate CRC cultures. In addition, TME stimulated stabilization of the master EMT-related transcription factor (Slug), which was accompanied by changes in the expression patterns of EMT-associated biomarkers. Moreover, TME resulted in stimulation of NF-κB, TGF-β1, and FAK signaling pathways. However, these effects were dramatically reduced by Calebin A, comparable to FAK inhibitor or CD. Finally, TME induced a functional association between NF-κB and Slug, suggesting that a synergistic interaction between the two transcription factors is required for initiation of EMT and tumor cell invasion, whereas Calebin A strongly inhibited this binding and subsequent CRC cell migration. We propose for the first time that Calebin A modulates TME-induced EMT in CRC cells, at least partially through the NF-κB/Slug axis, TGF-β1, and FAK signaling. Thus, Calebin A appears to be a potential agent for the prevention and management of CRC.

Upender Manne, Ph.D.

Director/ Professor, Anatomic Pathology, University of Alabama at Birmingham School of Medicine, Birmingham AL
Email: upendermanne@uabmc.edu

Presentation Title: Interplay of Molecular Factors and Comorbid Conditions in Cancer Disparities

Disparities in cancer prevalence, incidence, and health outcomes for different racial/ethnic groups are attributed to the interplay of various socioeconomic, cultural, environmental, and biological factors. Studies are indicating that higher rates for incidence and mortality (e.g., late-stage aggressive colorectal cancers (CRC) for African Americans (AAs); advanced stages of prostate cancer, particularly castration-resistant type for AAs; and triple-negative breast cancers (TNBCs) for AA women) are due to distinct biological factors. We have shown that both male and female AA patients are more frequently diagnosed with proximal CRCs and have poorer overall survival than non-Hispanic Caucasians (CAs). Abnormal expression of p53 is an indicator of poor survival of CA patients with proximal colon tumors. However, abnormal p53 has no prognostic value for AA or CA patients with distal or rectal tumors (Cancer. 1998; 83(12):2456-67). Also, abnormal p53 is higher in CRCs of low socioeconomic patients (J Gastrointest Oncol 2013; 4(1):40-4). In contrast, a higher frequency of a single nucleotide

polymorphism (SNP) at codon 72 of p53 leading to the Pro/Pro phenotype is associated with advanced tumor stage and with short survival of AA but not CA patients with CRCs (Clin Cancer Res. 2009; 15(7):2406-16). Higher expression of miRNA-181b is correlated with poor survival of only AA patients with stage III CRC (HR = 1.94; 95% CI, 1.03-3.67) (Clin Cancer Res. 2013; 19(14): 3955-65). Data from the National Health and Nutrition Examination Survey suggest that the higher prevalence of chronic kidney disease (CKD) for AAs, compared to CAs, is linked with a higher risk of cancer (21% with CKD vs. 12% without CKD) and mortality (unpublished). In a cancer-only analysis, overrepresented tumor types in CKD vs. non-CKD patients were prostate (23% vs. 6%) and colon (7% vs. 4%). Cases of colon cancer were higher for CKD patients of all races, with the largest CKD-related difference for female AAs (28% in CKD vs. 7% in non-CKD). Overall, CKD is a frequent comorbidity for cancer patients relative to cancer-free patients, even when accounting for age. This relationship is modified by tumor type, race, and gender. Prostate and colon cancers have strong associations with CKD, which are independent of age of AAs. Obesity is linked to CKD-comorbid colon cancers for AAs and males. These findings identify high-risk subgroups for colon cancer and suggest adietary/metabolic/environmental etiology, indicating that intervention strategies would reduce the cancer burden for CKD patients. Preliminary analyses of the genomic and transcriptomic data in our TNBC cohort showed that an SNP at codon 72 of p53 (Arg/Arg) is associated with obesity(body mass index, BMI>30) for women with breast cancer, particularly for obese AA women with TNBCs. We identified higher expression of two enzymes (KLK5, GSTA1), a tumor suppressor/differentiation protein (WFDC1) , an Ets transcription factor (ELF5), and a stem cell maker (LGR6) as risk factors for obese AA women who exhibit the Arg/Arg phenotype of p53 for developing the BL1 sub-type of TNBCs. Further, for obese AA and CA TNBC women, the Arg/Arg phenotype of p53 was associated with an immune cell abundance (e.g., low M1 macrophages/activated memory CD4 in AAs) (unpublished). These analyses indicate that distinct molecular alterations contribute to cancer health disparities. Most of these studies are supported by a grant from the Center to Reduce Cancer Health Disparities branch of the National Cancer Institute (U54CA118948).

Nadeem Zafar, M.D.

Director, Pathology & Laboratory Medicine Service, VA Puget Sound Associate Professor, Department of Laboratory Medicine & Pathology, University of Washington

Presentation Title: Promoting Healthcare As A Career for Minority Students To Fight Cancer Health Disparity

Health disparities are differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States" (1). Cancer affects all population groups in the United States, but due to social, environmental, and economic disadvantages, certain groups bear a disproportionate burden of cancer compared with other groups(2). Cancer disparities (Cancer Health Disparities) are differences in cancer measures such as incidence, prevalence, mortality, survival, morbidity, survivorship, financial burden, screening rates or stage at diagnosis. As examples, Blacks/African Americans have higher death rates than all other racial/ethnic groups for many, although not all, cancer types. People with more education are less likely to die prematurely (before the age of 65) from colorectal cancer than those with less education, regardless of race or ethnicity. Hispanic/Latino and Black/African American women

have higher rates of cervical cancer (a preventable cancer) than women of other racial/ethnic groups, with Black/African American women having the highest rates of death from the disease. Healthcare and cancer disparities are also related to the educational maturity of a community: people with more education are less likely to die prematurely (before the age of 65) from colorectal cancer than those with less education, regardless of race or ethnicity(2).Cancer healthcare disparity is also related to the composition of our higher education student cohort, including US medical school graduates. American Association of Medical Colleagues (AMMC) 2015 diversity fact and figures indicate that just 6% of the graduates were Black or African American and 5% were Hispanic or Latino. In addition, Black or African American applicants have lower medical school acceptance rates than other peer applicants (3). The states with the highest proportion of Hispanic/Latino physicians in 2014 were New Mexico, Florida, Texas, Arizona and California, while the states with the highest proportion of Black/Afro-American physicians were Georgia, Maryland, Mississippi, Louisiana and North Carolina (4), indicating uneven distribution of minority physicians. Medical Pathology also has a very low representation of Black or African American members to the point where one African American Pathologist, prominent on social media, has described herself as “almost a unicorn” (5) There is definitely a “pipeline issue” with significant hurdles for children from African American community to envisage a career in medicine, especially in Pathology. This contributes to cancer and general healthcare disparity through hampering inclusion and involvement and dissemination of useful information to enhance minority community awareness and welfare and decrease healthcare and cancer disparity. It is critical to widen the educational pipeline for it to be made more inclusive and for medical schools to partake and benefit from programs sponsored by organizations like Health Career Collaborative (6) and Summer Health Professions Education Program (7) with a proven track record for enhancing awareness for healthcare careers for the American minority.

Rakesh Kumar, Ph.D.

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Presentation Title: Science and Medicine: A Priceless Journey

The Science and Medicine and medical scientists are core for the human wellbeing and prosperity of our society. In general, we the scientists are attempting to break the barriers every day, by taking small steps, following new ideas, which at-times, with no precedence, while seeking answers to important mysteries in science. All the big achievements in science that are recognized today are the result of countless hours of effort and the culmination of tiny discoveries. It didn’t matter how incremental each of those tiny discoveries were at the time, because each one of these invisible steps were needed to build a link, leading to the big result and take the field forward. As a matter of fact, as cancer scientists, we’re engaged in one very long and continuous conversation. In this context, treads of some of the modern discoveries in cancer research could be tracked down to papers published long time back. In any profession, you always remember the turning-points of your career -the invisible turns might had allowed someone to discover his/her dreams and formulate their life-long mission, shaping years to come in a profound manner, and in-turn, advancing the field in a meaningful manner. Everyone has their own personal journey which might have been shaped by design, serendipity,

passion, past experiences, events, or your mentor(s) -trusted people you can talk and learn from. The speaker will share some of his learning and experience about the joy of discovering and looking forward in science, while surfacing the value of his mentors in sharing their wisdom and experience. In addition, he will summarize the contribution of his laboratory over the past few decades to the molecular events that are fundamental to cancer progression and metastasis and share his thoughts how some of these findings might offer new opportunities to health disparity cancer research.

Alok Chandra Bharti, Ph.D.

Professor, Department of Zoology, Molecular Oncology Laboratory- University of Delhi, India

Presentation Title: Plant-derived homeopathic preparations with anti-cervical cancer and anti-Human papillomavirus activity as alternative to mitigate cancer health disparity

Tejveer Singh, Nikita Aggarwal, Arun Chhokar, Joni Yadav, Divya Janjua, Apoorva Chaudhary, Tanya Tripathi, Suhail Chhakara, **Alok Chandra Bharti***

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The majority of cervical cancer burden is contributed by developing and underdeveloped countries. This gap in the cancer occurrence worldwide is an outcome of the cancer health disparities prevailing in society accounting for the differences in the cancer mortality rates across the world. The issue is complicated by absence of HPV-specific treatment modalities of clinically advanced cervical cancer and high cost of generic therapies. Over last decade, our group has been working towards depicting the significant anti-cancer and anti-HPV activity associated with pure compounds of herbal origin (curcumin, berberine), crude herbal extracts (fruit extract of *Phyllanthus emblica* and leaf extract of *Bryophyllum pinnata*) or their mixture as polyherbal formulation (Praneem & Basant) both in *in-vitro* as well as in clinical settings. However, these pure compounds have not been translated into clinically-viable drugs. Therefore, we explored an alternate platform of homeopathy which involved the usage of the clinical preparations derived from these plants. In our study, we evaluated the anti-CaCx and anti-HPV activities of certain plant derived-homeopathic preparations *in vitro* on HPV positive (SiHa and HeLa) and HPV negative (C33A) cervical cancer (CaCx) cell lines. HP mother tincture (MT) and 30C potencies of plants *Berberis aquifolium*(BA), *Berberis vulgaris*(BV), *Mentha piperita*(MP), *Curcuma longa*(CL), *Cinchona officinalis*(CO), *Thuja occidentalis*(TO) and *Hydrastis canadensis*(HC) were screened for their anti-proliferative activity. Initially, we screened the anti-proliferative and anti-oxidant activity by DPPH and ABTS assay and estimated the total phenolic content by TPC assay. We further analyzed the inhibitory action of the phytochemicals present in these HP on HPV16 E6 in-silico via molecular docking using AutoDoc, PyMol and Discovery Studio. Further, the molecular mechanisms were determined via examination of multifactorial action of BAMT, the most promising lead on CaCx cells. BAMT induced cell death and G1 growth arrest in CaCx cell lines irrespective of the HPV status of cervical cancer cells. Molecularly, these homeopathic preparations target oncogenic transcription factors of STAT3 and AP-1 family that resulted in diminished oncoprotein expression. Taken together, our data supports use homeopathic preparations as promising economic and safe alternative for cancer therapeutics against cervical cancer in low resource settings.

Varsha Gupta, Ph.D.

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Presentation Title: Disparities in Occurrence of Cancer Due to Different Treatment Modalities in Rheumatoid Arthritis Patients

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Rheumatoid arthritis(RA)is inflammatory disorder characterised by ongoing inflammatory responses which involve multiple joints and is the leading cause of increased morbidity and mortality. Malignant lymphoma, infections and cardio vascular diseases tend to increase severity of RA. The disease itself and its treatment can contribute in increasing overall risk of cancer in the RA patients. Cancer management in rheumatic patients pose a big challenge as it requires several considerations due to maintenance of these patients on immuno-suppressive therapies. Given the fact that anti-cancer agents in low dose are used to treat the ongoing inflammation in RA patients, however, both beneficial and adverse responses are observed. Treatment of RA with disease modifying anti rheumatic agents (DMARDs) can increase the risk of cancer as studies have found association between augmented tumorigenesis and DMARDs. Methotrexate (MTX) considered as gold standard for treating RA might be associated with lymphoproliferative disorder(MTX-LPD) while salicylates could reduce the risk of malignancies in RA patients. RA patients are also prone for reoccurrence of cancers with usage of different treatment modalities. In this study we aim to address disparities in the occurrence of various cancers with respect to different treatment modalities in rheumatoid arthritis patients.

Mr. Erik Steinfelder

Director, Biobanking Market Development- Thermo Fisher Scientific

Presentation Title: Biobanking in Cancer Related Research

Ajaikumr B. Kunnumakkara, Ph.D.

Cancer Biology Laboratory & DBT-AIST International CENter for Translational and Environmental Research (DAICENTER)

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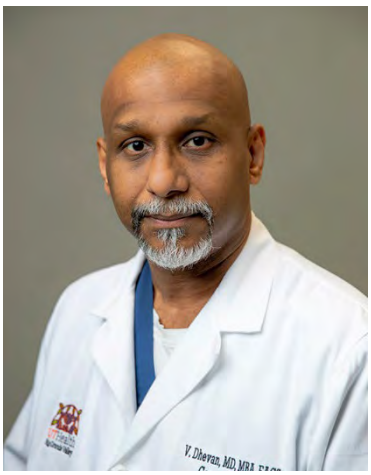
Presentation Title: Health Disparities in Oral Cancer
Aviral Kumar and Ajaikumar B Kunnumakkara

Abstract: Oral cancer, one of the most commonly occurring head and neck cancers, is associated with lower socioeconomic status in developing countries. The associated risk factors like tobacco smoking, alcohol intake, areca nut, human papillomavirus (HPV), poor oral hygiene shape the oral cancer etiology. Recent investigations have widened our understanding of the interplay between social determinants like health, biology, behavior, and genetics, reflecting the health disparities among oral cancer patients. It is well known that economic inequalities and lifestyle deprivations contribute to the poor health of individuals. Various studies have linked the area-level health deprivations like ineffective screening and financial burdens as a direct causative factor for an increased prevalence of oral cancer. Moreover, the response to major anti-cancer therapeutics is controlled by the disparities between patients. Therefore, there is a need to spread awareness about the change in health behavior for mitigating life threatening risk factors of oral cancer. Hence, it is crucial to identify and enlarge existing complex frameworks for identifying disparities in populations and participate as a global community to develop innovative and sustainable strategies to eliminate oral cancer.
Keywords- Oral cancer, health disparities, risk factors, economic inequalities

Patty Moore, Ph.D.

Senior Program Manager for Research- CPRIT

Presentation Title: Overview- Cancer Prevention & Research Institute of Texas (CPRIT)



Vijian Dhevan, M.D., MBA, FACS

Board Certified General Surgeon- UT Health RGV

Presentation Title: Cancer Disparities in the Lower Rio Grande Valley

Eduardo C. Lazcano-Ponce, M.D., Ph.D.

Dean, El Instituto Nacional de Salud Pública (INSP), Mexico

Presentation Title: The Epidemiologic Panorama of Cancer in Mexico

Catherine Kaschula, Ph.D.

Professor, Department of Chemistry and Polymer Science, Stellenbosch University, South Africa, 7600

Presentation Title: Investigations into the cytotoxic mechanism of the garlic compound ajoene in cancer cells

Catherine H Kaschula, Daniel A Kusza (b), Roger Hunter (b)

(b) Department of Chemistry, University of Cape Town, South Africa

Background: Cancer is a disease that affects people regardless of race, geography or socioeconomic status. Treatment options are limited, and often unaffordable to those in developing nations such as South Africa. Prevention in this context is thus an attractive intervention strategy against the disease. Garlic is a medicinal and dietary plant that has been used in folk medicine since the beginning of time, and it is

active against the different stages of cancer. The bioactive compounds in garlic are produced during the processing of the cloves, and one of these compounds is the vinyl disulfide organosulfur compound ajoene. Ajoene acts by S-thiolating cysteine residues on proteins. **Methods and results:** We have developed a synthetic route to ajoene analogues which has enabled the synthesis of more potent ajoenes, as well as fluorescent and biotinylated analogues. By tracking the movement of fluorescently labelled ajoene, we found that it localises to the endoplasmic reticulum of MDA-MB-231 breast cancer cells. Here, ajoene was found to interfere with protein folding and to activate the unfolded protein response. In another experiment, we used the biotinylated ajoene probe to tag and pull down the targets of ajoene. We have identified and validated a number of these targets, many of which contain reactive cysteines, involved in the maintenance of cancer homeostasis. **Conclusion**: We have identified the cysteineome involved in the anti-cancer activity of the garlic compound ajoene.

Shailesh Singh, Ph.D.

Professor, Department of Microbiology, Biochemistry & Immunology- Morehouse School of Medicine

Presentation Title: Associate of CC chemokines with Breast Cancer Disparity

FLASH TALKS

MODERATOR: DR. MURALI YALLAPU

Eron Grant Manusov, M.D.

Presentation Title: Gene-by-Environment Expression and Calculation of the Frailty Index

Manusov, E; Diego, V; Mahaney, M; Blangero, J; Williams-Blangero, S. Department of Human Genetics. University of Texas Rio Grande Valley School of Medicine

ABSTRACT 248words - Mexican Americans, Frailty, Frailty Index, Gene-by-Environment, Heritable

Background: Frailty can be described as a phenotype (e.g., sarcopenia, reduced grip strength, decreased VO2 max) or as a ratio of deficits, i.e., a Frailty Index(FI). FI predicts survival, death, cognitive impairment, falls, and hospitalizations. Frailty is influenced by both genes and environment. We calculated the FI as the sum of measured deficits divided by the total number of items assessed in a pedigree-based sample of 1,029 Mexican Americans participants in the San Antonio Family Heart Study. We performed a novel search for genotype-by-environment interactions (GXE) influencing FI. Such interactions lead to heritable differences between individuals in their responses to the environment. **Methods:** We investigated a panel of 34 measured environmental factors to look for GXE influencing frailty. We employed a powerful polygenic approach to genotype-by-environment modeling, allowing for both dichotomous and continuous environmental measures. We performed likelihood-based estimation of parameters and tests for the presence of GXE. **Results:** GXE interactions influencing frailty were observed for the following environments: obesity (P=7.9E-10),hypertriglyceridemia(P=2.74E-09),low HDL(P=2.15E-06), impaired glucose status(P=.002), hypertension(P=0.01), and diabetes(P=0.02),Additionally, GXE interactions were detected for a number of quantitative dietary components: carbohydrates (P=5.73E-07), fats(P=2.01E-06), fiber(P=2.76E-05), dietary cholesterol(P=0.01), and protein(P=0.006). These results document substantial statistical evidence for the interactive effects of genes and environmental factors on frailty. **Conclusion:** Our results support the presence of substantive gene-by-environmental interactions influencing frailty. This finding documents the presence of heritable differences between individuals that lead to differential response to environmental challenges.

Faiza Ahmad, Medical Student

Presentation Title: Mind, Body and Race: A Look Into How Implicit Biases Influence the Perception of Emotion

Faiza Ahmad.(1), James Rounds (2), Christina F. Chick, Ph.D. (3), Alizé B. Hill (4), and Adam K. Anderson, Ph.D.(2)
(1) University of Texas - Rio Grande Valley School of Medicine (2) Dept. of Human Development, Cornell University (2) Dept. of Psychiatry and Behavioral Sciences, Stanford University School of Medicine (3) Dept. of Social Work, University of Chicago

Felipe-Andres Piedra, Ph.D.

Presentation Title: Multiple RSV strains infecting HEp-2 and A549 cells reveal cell line-dependent differences in resistance to RSV infection

Anubama Rajan (a*) , Felipe-Andrés Piedra (a*), Letisha Aideyan (a) , Trevor McBride (a) , Matthew Robertson (b, c) , Hannah L. Johnson (d) , Gina Marie Aloisio (a) , David Henke (a) , Cristian Coarfa (b,c), Fabio Stossi (b,d), Vipin Kumar Menon (e) , Harshavardhan Doddapaneni (e) , Donna Marie Muzny (e) , Sara Joan Javornik Cregeen (a), Kristi Louise Hoffman (a) , Joseph Petrosino (a) , Richard A Gibbs (e) , Vasanthi Avadhanula (a#) , and Pedro A. Piedra (a, f#)

(a) Department of Molecular Virology and Microbiology, Baylor College of Medicine, Houston, Texas, USA; (b). Molecular and Cell Biology-Mol. Regulation, Baylor College of Medicine, Houston, TX, USA; (c). Dan L Duncan Comprehensive Cancer Center, Baylor College of Medicine, Houston, TX, USA; (d). Integrated Microscopy Core & GCC Center for Advanced Microscopy and Image Informatics, Baylor College of Medicine, Houston, TX, USA; (e). Department of Molecular and Human Genetics, Baylor College of Medicine, Houston, Texas, US; and (f). Department of Pediatrics, Baylor College of Medicine, Houston, Texas, USA
*Co-first authors worked together on the manuscript and contributed equally.

Background: Respiratory syncytial virus (RSV) is the major viral driver of a global pediatric respiratory disease burden disproportionately borne by the poor[1]. Thus, RSV, like SARS-CoV-2, combines with congenital and environmental and host-history-dependent factors to create a spectrum of disease with greatest severity most frequently occurring in those least able to procure treatment. **Methods:** Here we apply whole genome sequencing and a suite of other molecular biological techniques to survey host-virus dynamics in infections of two distinct cell lines (HEp2 and A549) with four strains representative of known RSV genetic diversity. **Results:** We observed non-gradient patterns of RSV gene expression and a single major difference in transcriptional readthrough correlating with a deep split in the RSV phylogenetic tree. We also observed increased viral replication in HEp2 cells along with a pro-inflammatory host-response; and decreased viral replication in A549 cells with a more potent antiviral response in host gene expression and levels of secreted cytokines. **Conclusions:** Our findings suggest HEp2 and A549 cell lines can be used as complementary models of host response leading to more or less severe RSV disease. In vitro perturbations inspired by actual environmental and host-history-dependent factors associated with greater disease can be tested for their ability to shift the antiviral response of A549 cells to the more proinflammatory response of HEp2 cells. Such studies would help illuminate the tragic costs of poverty and suggest public health-level interventions to reduce the global disease burden from RSV and other respiratory viruses.

Kashish Kumar, High School Student

Presentation Title: Human iPSC derived cardiomyocyte model reveals the transcriptomic bases of COVID-19 associated myocardial injury

Kashish Kumar (1), Satish Kumar (1), Erica De Leon (1), Joanne E. Curran (2), Sarah Williams-Blangero (1,2), John Blangero (2)
(1) Department of Human Genetics and South Texas Diabetes and Obesity Institute, University of Texas Rio Grande Valley School of Medicine, McAllen, TX 78539. (2) Department of Human Genetics and South Texas Diabetes and Obesity Institute, University of Texas Rio Grande Valley School of Medicine, Brownsville, TX 78520.

Background: Multi-organ complications have been the hallmark of severe COVID-19; cardiac injuries were reported in 20% to 30% of hospitalized COVID-19 patients, although the disease etiology remains poorly understood. This study leveraged genome-wide RNA-sequence data generated using induced pluripotent stem cell (iPSC) differentiated cardiomyocytes (CMs) and invitro modeling of SARS-CoV-2 infection in CMs, to understand the molecular mechanisms of COVID-19 myocardial injuries for novel diagnostic and therapeutic development. **Methods:** Raw RNA-sequence data sets, GSE165242 and GSE150392 were aligned to human genome assembly GRCh38 and gene expressions were quantified. Differentially expressed (DE) genes between experimental groups were identified using moderated t-statistics (FDR-corrected p-value≤0.05) and Fold-Change analysis (FC absolute ≥ 2.0). **Results:** A total of 2,148 genes were significantly DE between SARS-CoV-2 infected and vehicle treated CMs and showed significant enrichment in cytokine signaling pathways (p-value=4.89E-25) and regulation of heart contraction (p-value=2.51E-19) gene-ontology biological processes. 606 of these DE genes were significantly upregulated during iPSC to CM differentiation. Disease and function annotation analysis of these 606 genes showed significant enrichment and activation of angiogenesis (p-value=4.04E-23; activation Z-score=3.7) and downregulation of heart contraction and related functions (p-value=4.24E-29; activation Z-score=-2.2) in SARS-CoV-2 infected CMs. The upstream regulator analysis identified upregulation of AGT associated proinflammatory genes and significant downregulation of TBX5and MYOCD transcription factors and their

gene networks, suggesting remodeling of CM contractility architecture. **Conclusions:** This study identified several AGT associated proinflammatory genes and TBX5 and MYOCD gene networks as potential targets for drug development to address COVID-19 associated cardiac injury.

Claudia Munguia, MPH

Presentation Title: Project: Center for Diabetes and Metabolism [Centro de Diabetes y Metabolismo: CeDiMet], a collaborative dream comes true

Claudia Munguia-Cisneros, MPH. CeDiMet, Universidad Mexico Americana del Norte, Reynosa, Tamps. Mexico. **Edith Cantude Luna, PhD,** CeDiMet, Universidad Mexico Americana del Norte, Reynosa, Tamps. México. **Carlos Ramirez-Pfeiffer, PhD**, Institutional Research Unit. Universidad Mexico Americana del Norte, Reynosa, Tam. Mexico. **Adriana Perales-Torres, PhD**, Universidad Autonoma de Tamaulipas, Reynosa, Tamps. Mexico. **Esperanza Garcia-Oropesa, PhD**, Universidad Autonoma de Tamaulipas, Reynosa, Tamps. **Estrella Martinez-Lopez, MSc**. Programa de doctorado en Ciencias de la Salud. Universidad Autónoma de Mexico, Ciudad de México, Mexico. **Alvaro Diaz-Badillo. PhD**, Department of Human Genetics, School of Medicine, University of Texas Rio Grande Valley, Texas USA. **Joselin Hernandez Ruiz. PhD**, Clinical Pharmacology Unit, Hospital General de Mexico, Dr. Eduardo Liceaga, Mexico city. **Alberto Omar Chavez-Velazquez, MD**. Texas Diabetes Institute,San Antonio, Texas USA. **Lucia M Perez-Navarro, PhD**. Service of Nephrology, Hospital General de Mexico Dr. Eduardo Liceaga, Mexico City. **Beatriz Tapia, MD**, **PhD**. Asst Dean Faculty Development • Faculty Affairs, University of Texas Rio Grande Valley, Texas USA. **Juan C Lopez-Alvarenga, MD**, PhD. Department of Human Genetics. University of Texas Rio Grande Valley, Texas, USA. Institutional Research Unit, Universidad Mexico Americana del Norte.

Reynosa urban area has 690,000 inhabitants (384,000adults >20 years old), 35% moved from other states. The use of cell phones is in 81%, personal computer or laptop with 29%. The prevalence of overweight is 39%, obesity 36%, and T2D 13%. The expected adult population with T2D is 49,900 individuals. The are 5 clinics prepared to attend T2D, and few with specialized personnel.

The CeDiMet is a collaborative clinic involving health personnel and researchers from the Universidad Mexico Americana del Norte, Universidad Autonoma de Tamaulipas, Hospital General de Mexico “Dr. Eduardo Liceaga”, University of Texas Rio Grande Valley, and the Texas Diabetes Institute in San Antonio. The funding source comes from private companies in Reynosa. The clinical structure includes physicians, nurses, nutritionists, psychologists, and a section for telemedicine for consulting specialists from USA and Mexico City. Besides clinical attendance, the CeDiMet will conduct educational activities in offices, factories, churches, and schools for prevention of obesity complications (T2D and hypertension), early detection of diabetic foot, fatty liver, and endothelial damage. “Tree of Health in the Family” is a program to encourage youth to know and understand the metabolic problems in their families to focus on prevention. Recently, we obtained a grant from COTACyT to explore the effect of COVID-19 in a cohort of 200 students and their families. The analysis of post-traumatic stress due to confinement and antibodies concentration to detect contact and its association with metabolic problems is an example of the research we can perform.

Vivek K. Kashyap, Ph.D.

Presentation Title: Smoking and Drinking Activates NF-κB /IL-6 Axis to Promote Inflammation During Cervical Carcinogenesis

Vivek K. Kashyap,(1,2,3) Prashanth K.B. Nagesh,(1,3,5) Ajay K. Singh,(3)Andrew Massey,(1,3,4) Godwin P. Darkwah (1), Murali M. Yallapu, (1,2,3) Meena Jaggi,(1,2,3)* and Subhash C. Chauhan (1,2,3)*

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ABSTRACT

BACKGROUND: High-risk strains of HPV are known to cause cervical cancer. Multiple clinical studies have emphasized that smoking and drinking are critical risk factors for cervical cancer and its high-grade precursors. In this study, we investigated the molecular mechanisms involved in the interplay of smoking and/or drinking with HPV infectivity and defined a systematic therapeutic approach for their attenuation in cervical cancer. **METHODS:** The impact of benzo[a]pyrene (B[a]P) and/or ethanol (EtOH) exposure on cervical cancer cells was assessed by measuring changes in cell proliferation, clonogenicity, biophysical properties, cell migration, and invasion. Expression of HPV16 E6/E7, NF-κB, cytokines, cell cycle, and inflammation mediators was determined using qRT-PCR, immunoblotting, ELISA, luciferase reporter assay and confocal microscopy. **RESULTS:** The exposure of cervical cancer cells to B[a]P and/or EtOH altered the expression of HPV16 E6/E7 oncogenes and EMT markers; it also enhanced cellular clonogenicity, migration, and invasion. In addition, B[a]P and/or EtOH exposure promoted inflammation pathways through TNF-α and NF-κB signaling, leading to IL-6 upregulation and activation of VEGFA. These molecular effects caused by B[a]P and/or EtOH exposure were effectively attenuated by Cur/PLGA-Cur. **CONCLUSIONS:** These data suggest a molecular link between smoking, drinking, and HPV infectivity in cervical carcinogenesis. However, these events were determined to be attenuated by treatment with Cur/PLGA-Cur treatment, implying its role in cervical cancer prevention/treatment. **Keywords:** Cervical cancer, HPV16 E6/E7; Cigarette smoking and drinking; Benzo[a]pyrene; Human immunodeficiency virus; NF-κB

Bilal Hafeez, Ph.D.

Presentation Title: Targeting tumor associated macrophages to improve the immunotherapy of pancreatic cancer

Mehdi Chaib, Murali M. Yallapu, Meena Jaggi, Subhash C. Chauhan and Bilal Bin Hafeez
Department of Immunology and Microbiology and South Texas Center of Excellence in Cancer Research, School of Medicine, University of Texas Rio Grande Valley, TX 78504

Abstract

Background: Tumor associated macrophages (TAMs) represent a major component of immune infiltrating leukocytes in tumor microenvironment. Soluble factors secreted by TAMs have been shown to promote cancer progression by establishing an immunosuppressive microenvironment that inhibits antitumor T-cell responses. TAMs also mediate resistance to conventional chemotherapies and contemporary targeted regimens. Therefore, targeting TAMs could be a novel approach to improve tumor immune surveillance and maximize the current chemo/immunotherapy response. **Methods and Results:** We have identified that a probiotic strain (*Lactobacillus casei*) derived siderophore (ferrichrome) efficiently reprograms Tumor-Associated Macrophages (TAMs) and increases CD8+ T cell infiltration into tumors that paralleled a marked reduction in tumor burden in a syngeneic mouse model of pancreatic cancer. Interestingly, this altered immune response improved anti-PD-L1 therapy that suggests promise of a novel combination (ferrichrome and immune checkpoint inhibitors) therapy for pancreatic cancer treatment. Mechanistically, ferrichrome induced TAMs polarization via activation of the TLR4 pathway that represses the expression of iron export protein ferroportin (FPN1) in macrophages. **Conclusion:** This study describes a novel probiotic based molecular mechanism that can effectively induce anti-tumor immunosurveillance and improve checkpoint blockade immunotherapy response against pancreatic cancer.

Sheema Khan, Ph.D.

Presentation Title: Therapeutic intervention using autologous exosomes for treatment of early-stage pancreatic cancer

Saini Setua, Poornima Shaji, Swathi Holla, Vincent Diego, Stephen W Behrman, Murali M. Yallapu, Meena Jaggi, Subhash C. Chauhan, Sheema Khan
Department of Immunology and Microbiology, School of Medicine, University of Texas Rio Grande Valley, McAllen, TX and Department of Surgery, University of Tennessee Health Science Center, Memphis, TN

Pancreatic cancer (PanCa) is the third deadliest cancer in United States with a poor survival rate. Despite extensive research efforts, there is not any substantial progress in cancer therapeutics; major challenges lie with inherent drug toxicity, ineffectiveness and resistance due to impediments against intracellular drug delivery. From a therapeutic delivery standpoint, novel delivery vehicles are required that are both biocompatible and non-immunogenic for a patient in order to maximize the chances of cure. This is possible by utilizing an autologous biological material, which can be applied as a personalized medicine to match the individual circumstances and molecular profile of the patient. One such approach has been optimized in our lab, which utilizes exosomes from the matched tumor adjacent normal (NAT) area following surgical resection. Using exosomes as a scaffold, our objective is to deliver therapeutics safely and effectively to the patient tumor site. NAT derived exosomes show effective size and zeta potential (size: 44.12 ± 0.89; Zeta potential: -14.9 mV), which is ideal for drug delivery purposes. The purification of exosomes was confirmed using proteins isolated from exosomes through Western blotting for expression of exosomal markers, such as CD63 expression. Immunofluorescence for CD63 expression confirmed the efficient delivery of exosomes in PanCa cells. Our results indicated high drug loading capacity of NAT derived exosomes as demonstrated using drug, Ormeloxifene (ORM) though UPLC. ExoORM treatment efficiently delivered ORM into the cancer cells and inhibited the cancer cell characteristics, such as, proliferation compared with ORM alone. Additionally, NAT derived exosomes showed enhanced expression of tumor suppressor microRNA, miR-145, suggestive of their therapeutic importance. We observed restoration of lost miR-145 levels in PanCa cells on incubation with NAT derived exosomes for 48hrs. This further indicates their relevance for their utilization in the development of an anti-cancer therapy. Our observations offer importance of the utilization of NAT derived exosomes for personalized medicine as a therapeutic delivery vehicle in PanCa.

Anupam Dhasmana, Ph.D.

Presentation Title: Exploration of potential natural inhibitors against KRAS-G12D in PanCan: Protein centered pharmacophore HTVS approach

Anupam Dhasmana, Swati Dhasmana, Sudhir Kotnala, Vivek Kumar Kashyap, Sheema Khan, Murali M Yallapu, Meena Jaggi, Subhash C Chauhan.
(1) Department of Immunology and Microbiology, School of Medicine, The University of Texas Rio Grande Valley, McAllen, TX 78504, USA (2) South Texas Center of Excellence in Cancer Research, University of Texas Rio Grande Valley, McAllen, TX 78504, USA.

Background: As per key statistics of American Cancer Society 2021, Pancreatic Cancer (PanCan) affects around 60,430 persons a year in the U.S. and is tricky to diagnose &treat. Studies revealed that African Americans have a 50–90% higher incidence of PanCan compared to other ethnic groups. Oncogenic KRAS mutation is the signature genetic incident in the progression and development of PDAC. KRAS is the most common protein which is 95% times mutated in PDAC condition. By considering this alarming situation our group is now focused on to develop therapeutic portfolio against KRAS-G12D mutation associated PanCan by using high through-put virtual screening(HTVS) approach. **Methodology:** In this study, prompt HTVS for vetting the best possible drug candidates from natural compound(NCs)databases has been implemented. Herein, time tested rigorous multi-layered drug screening process to narrow down 66,969 NCs for the identification of potential lead(s) is implemented. Druggability parameters, protein centered pharmacophore-based drug selections &different docking approaches(Rigid & Flexible)were employed in this study. **Result**: By using different NCs

databases around 66,969 NCs were screened based on protein-centered pharmacophore fit score &binding energies. Less than 0.001% of potential NCs were selected against the known & reference KRAS-G12D inhibitor (BI2852). **Conclusion:** By using HTVS approach we have identified a pool of natural inhibitors against KRAS G12D.
Keyword: KRAS-G12D, PanCan, Natural Compound, HTVS, Pharmacophore

Sudhir Kotnala, Ph.D.

Presentation Title: Mucin MUC13 and YAP1 correlate with poor survival in colorectal cancer

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Background: Metastatic disease contributes to over 90% of cancer-associated deaths. Colorectal cancer (CRC), the second lethal malignancy, has the greatest incidence and mortality rates in the Southern United States. Over 40-50% of CRC patients acquire metastasis at some point throughout their disease's progression. CRC survival rate drops from 90%-14% when the disease is confined within the colon and therefore "early diagnosis" becomes imperative to determine timely and quality treatments. We have identified that MUC13 protein translocate to nucleus along with transcription factor Yes-Associated Protein 1 (YAP1)during anchorage independent conditions (metastatic phenotype). YAP1 is known to be overexpressed in CRC which promotes proliferation and survival of CRCcells. This study will provide information regarding MUC13 and YAP1correlation and their role in CRC patient outcomes**. Methods:** The comparative analysis of MUC13and YAP1expression in CRC samples (Tissue Microarrays (TMA) of CRC patients (39 cases and 95 cores))with Pathology grade, TNM Classification, Clinical stage, and Survival information were investigated using Immunohistochemistry (IHC) staining, followed by digital scanning by 3D-Histech scanner, and analysis using QuantCenter image analysis software. **Results:** IHC analysis revealed increased MUC13 expression in colon adenocarcinoma and metastatic adenocarcinoma compared to normal colon tissues. MUC13 expression was observed in nucleus, cytoplasm and membrane associated with mostly with poorly differentiated adenocarcinomas, while YAP1 was localized in the nucleus. The correlation of MUC13/YAP1 expression with patient outcome is in progress. **Conclusion:** This study will potentially establish a correlation between MUC13 and YAP1 with CRC patient outcome.
Keywords: Colorectal cancer, Tissue Micro-Array, Immunohistochemistry, MUC13, YAP1.

Blanca I. Restrepo, Ph.D.

Presentation Title: Tuberculosis in elderly Hispanics: BCG vaccination at birth is protective and diabetes is not a risk factor

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Abstract

Background: Aging increases the risk of tuberculosis (TB) and its adverse outcomes, but most studies are based on secondary analyses, and few are in Hispanics. Diabetes is a risk factor forTB in adults, but its contribution in the elderly is unknown. We aimed to identify the role of other risk factors for TB in elderly Hispanics. **Methods:** Cross-sectional study among newly-diagnosed TB patients, recent contacts (ReC), or community controls (CoC) totaling 646 participants, including 183 elderly (>60 years; 43 TB, 80ReC, 60 CoC) and 463 adults (18 to 50 years; 80 TB, 301 ReC and 82 CoC). Host characteristics associated with TB and latent Mycobacterium tuberculosis infection (LTBI) were identified in the elderly by univariable and confirmed by multivariable logistic regression. **Results:** LTBI was more prevalent among the elderly CoC (55% vs. 23.2% in adults; p<0.001), but not in ReC (elderly 71.3% vs. adult 63.8%); p=0.213). Risk factors for TB in the elderly included male sex (adj-OR 4.33, 95% CI 1.76, 10.65), smoking (adj-OR 2.55, 95% CI 1.01, 6.45)and low BMI (adj-OR 12.34, 95% CI 4.44, 34.33). Unexpectedly, diabetes was not associated with TB despite its high prevalence (adj-OR 0.38, 95% CI 0.06, 2.38), and BCG vaccination at birth was protective (adj-OR 0.16, 95% CI 0.06, 0.45). **Conclusions:** We report novel distinctions in TB risk factors in the elderly vs. adults, notably in diabetes and BCG vaccination at birth. Further studies are warranted to address disparities in this vulnerable, understudied population.

Blanca I. Restrepo, Ph.D.

Presentation Title: Case report: Chronic diabetes and COVID-19: A perfect storm for reactivation tuberculosis (TB)?

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Abstract

Background: The Coronavirus disease 2019 (COVID-19) pandemic is predicted to have a net negative effect on tuberculosis (TB)control, with an estimated excess of 6.3 million tuberculosis cases and 1.4 million deaths by 2025. Programmatic issues like the lockdown of TB services affect all patients, while biosocial factors have a differential impact on an individual's risk for TB or adverse TB outcomes. **Case presentation:** We report three cases of incident TB after resolution of COVID-19 episodes. Coincidently, all cases shared a common risk factor: a chronic history poorly-controlled diabetes. **Conclusions:** Our findings alert to the threat posed by the synergy between COVID-19 and diabetes, on TB reactivation. In medium-to high-risk settings for TB, we recommend implementation of routine screening for latent TB infection in these cases, and preventive TB treatment in those who are positive.

Keywords: tuberculosis; COVID-19; SARS-CoV-2; diabetes mellitus; type 2 diabetes; diagnostic delays

Luis M. Rodriguez Martinez, Ph.D.

Presentation Title: Production of codon optimized Polyomavirus

Xavier Rios, Undergraduate Student

Presentation Title: Development and validation of a simple clinical construct for prediction of new type 2 diabetes mellitus.

Xavier Rios, Blanca I. Restrepo, Ph.D., and Juan Carlos Lopez Alvarenga, M.D., DSC

Manish K. Tripathi, Ph.D.

Presentation Title: Potential Involvement of a Glycoprotein MUC13 Mucin in Colorectal Cancer Health Disparity

Mohammed Sikander, Ph.D.

Presentation Title: Addressing PKD1 in Prostate Cancer Disparity: Implication for Drug Repurposing

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ORAL PRESENTATION ABSTRACTS

Community/Public Health

MRNA-1273 COVID-19 VACCINE LEADING TO ANTI-LGI1 LIMBIC ENCEPHALITIS FLARE.
Cesar A. Peralta

Background: Here, we discuss a patient with a past medical history of Anti-LG1 limbic encephalitis that presented with seizure-like activity approximately three weeks after the administration of the mRNA-1273COVID-19 vaccine.
Case Description: A 75-year-old male with a history of Anti-LG1 limbic encephalitis presented to our hospital with bilateral, truncal myoclonus and lateral nystagmus. EEG showed periodic lateralized epileptiform discharges. Brain MRI was unremarkable. The lumbar puncture was not suggestive of meningoencephalitis and the patient was diagnosed with a clinical relapse of Anti-LG1 limbic encephalitis, started on IVIG, methylprednisolone, azathioprine, and antiseizure medications. After absence of seizure activity was documented, he was discharged with instructions to follow up with neurology and advised to withhold the second dose of the COVID-19 vaccine.
Discussion: Our patient was previously diagnosed with anti-LGI1 in 2011and had been clinically stable without seizures since 2016. His relapse could have been triggered by an immunological response to theCOVID-19 vaccine. Although vaccine administration does not pose a more prominent danger than natural SARS-CoV-2 infection the temporal association raises the possibility of the vaccine as a trigger for the patient's autoimmune limbic encephalitis relapse. Unfortunately, little is known about how to predict, prevent or ameliorate these events in certain immunologically predisposed individuals or if the temporal association reported here represents an adverse event of the mRNA-1273COVID-19 vaccine. Ongoing reporting and further research are warranted to evaluate if this association can be confirmed, and if so, understand if there is a plausible underlying immunological mechanism.

THE "CUSHION EFFECT" REVISITED:
Principal Investigators: Flores, George MD, Annelyn Torres Reveron, Ph.D., Barreda, Raul MD
DHR Health Surgery Department 5501 S McColl Rd, Edinburg, TX 78539 In collaboration with UTRGV Surgical Residency

Background: It is known the pattern and severity of injuries sustained during a motor vehicle accident depend on many variables. An interesting avenue for research is obesity as a positive or negative modifier for injury distribution patterns in MVA. We hypothesize that body mass index (BMI) will influence MVC related injury patterns. **Methods:** We queried STRAC data for DHR -Edinburg for the years 2014 to 2018 using CPT codes for MVC/MVA, IS > 8, age 15 -64. Interactions between injury location, BMI, seatbelt and gender were analyzed. **Results:** We had 191 detailed crashes, we found increasing age to be protective for abdomen and pelvis (OR .94), increasing BMI to be predisposing for extremity injuries (OR 1.06) and increasing BMI and female gender together to be protecting for head and neck injury (OR .98). Patient without abdominal injuries were younger with lower BMI. However sample size small (46). **Conclusion:** BMI seems to have an exacerbating effect on extremity injuries and a protective effect for head and neck injuries driven predominantly by females. We believe this likely due to an increase in momentum effect of each appendage and a decrease in torque of the neck. Age seems to be protective and we believe this is primarily due to hormonal deposition of adipose.

SYNTHESIS AND EVALUATION OF SULPHONAMIDE CLUBBED THIOPHENES AS DIHYDROGEN PTEROATE SYNTHASE INHIBITORS

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Abstract

Background: Derivatives of thiophene and sulphonamide showed various pharmacological activities including antimicrobial and dihydrofolate reductase (DHFR) inhibition activity. Dihydrofolate reductase and dihydropteroate synthetase enzymes are responsible for bacterial growth and cell proliferation of cancer cells. **Method:** In the first step, thiophene was synthesized from cyclohexanone, sulphur and ethyl cyanoacetate by Gewald reaction. Second step involved cyclization of ethyl 2-aminothiophene-3-carboxylate conducted using formamide. In the third step, the carbonyl group was replaced by chlorine in the presence of POCl3. Then the chlorine group was removed by substituted sulphonamide. A series of derivatives were synthesized and evaluated for antimicrobial, anti-oxidant and DHFR inhibition activity. Newly synthesized derivatives of sulphonamide clubbed thiophene showed moderate to excellent antimicrobial and DHFR inhibition activity. **Results:** A series of thiophene clubbed sulphonamide conjugates were designed, synthesized and their structures were characterized using 1H NMR, 13C NMR, IR and HR-MS spectral analysis. The antioxidant activity was performed by DPPH and hydrogen peroxide method. Among these derivatives, the compounds a and b showed comparable anti-oxidant activity 76.29% and 73.25% respectively against DPPH as compared to standard drug ascorbic acid (82.68%). Remaining conjugates displayed significant anti-oxidant activity. The docking study was performed using Molegro virtual docker (MVD) molecular docking suggested a remarkable binding pose for all the thiophene linked sulphonamide derivatives. **Conclusion:** Compounds with electron donating groups showed potential activity. The binding affinity of these derivatives against dihydropteroate synthetase (DHTS) and dihydrofolate reductase (DHFR) enzymes were confirmed by molecular docking studies. The ADME and toxicity profile was studied. The compounds can serve as potential DHFR and DHTS inhibitors.

RANDOMIZED CLINICAL TRIALS OF OBESITY TREATMENTS IN MEXICAN POPULATION. SYSTEMATIC REVIEW AND META-ANALYSIS

Rosas-Díaz M (1), García-Oropesa EM (1), Perales-Torres AL (1), Martínez-López YE (2), Ruiz-Cejudo MS (2,3), Martínez-Ezquerro JD (2,3), Díaz-Badillo A (4,11), Ramírez-Pfeiffer C (4), Bustamante-Fuentes A (9), López-Sosa EB (10), Nava-González EJ (6), Pérez-Navarro LM (7), Moctezuma-Chávez OM (8), Carter K (11), Tapia B (11), López-Alvarenga JC (4,11) (1) Unidad Académica Multidisciplinaria Reynosa-Aztlán, Universidad Autónoma de Tamaulipas UAT, Mexico (2)Universidad Nacional Autónoma de México UNAM, Mexico City, Mexico (3) Mexicode Investigación Epidemiológica y en Servicios de Salud,Área Envejecimiento (UIESSAE), IMSS, Mexico City (4) Universidad México-Americana del Norte. Reynosa, UMAN Tamaulipas, Mexico (5) Centro Médico Nacional Siglo XXI, Instituto Mexicano del Seguro Social, IMSS, Mexico City, (6) Facultad de Salud Pública y Nutrición, Universidad Autónoma de Nuevo LeónUANL, Monterrey, Nuevo León, Mexico. (7) Servicio de Nefrología, Dirección de Investigación, Hospital General de México Dr. Eduardo Liceaga, Mexico City. (8) Asociación Odontológica Mexicana para la Enseñanza y la Investigación. Mexico City. (9) Escuela de Medicina, Universidad Panamericana Mexico City, Mexico (10) Cirugía General, Hospital Español, Mexico City, Mexico (11) University of Texas Rio Grande Valley. UTRGV, Edinburg, Texas. United States of America.

Background: Mexicans and Mexican Americans share similar culture, genetic background, and predisposition for obesity and diabetes. Randomized clinical trials (RCT) assessing obesity treatments (ObT) are reliable to assess efficacy. To date, there is no systematic review to investigate ObT tested by RCT in Mexican adults. **Methods:** We conducted systematic searches in Pubmed, Scopus, and Web of Science to retrieve ObTRCT through 1990 to 2019. The ObT included alternative medicine, pharmacological, nutritional, behavioral, and surgical interventions. The analyzed RCT were at least three months of duration, and reported: BMI, weight, waist circumference, triglycerides, glucose and blood pressure. **Results:** We found 634 entries; after removal of duplicates and exclusions based on eligibility criteria, we

analyzed 43 and 2multinational-collaborative studies. Most of the national studies had small sample sizes, and did not have replications from other studies. The nutrition/behavioral interventions were difficult to blind, and most studies had medium to high risk of bias. Random effects meta-analysis of nutritional/behavioral interventions and medications showed effects on BMI, waist circumference, and blood pressure. Simple measures like plain water instead of sweet beverages decreased triglycerides and systolic blood pressure. Participants with obesity and hypertension had beneficial effects with antioxidants, and the treatment with insulin increased weight in those with T2D. **Conclusions:** The RCT's in Mexico reported effects on metabolic components despite small sample sizes and lack of replication. In the future we should analyze ObT in population living on the U.S.-Mexico border; therefore, bi-national collaboration is desirable to disentangle cultural effects on ObT responses.

CHILDHOOD CANCER SURVIVAL IN THE HIGHLY VULNERABLE POPULATION OF SOUTH TEXAS: PERSISTENT CHALLENGES FOR ADOLESCENTS AND HISPANIC ETHNICITY

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Abstract
Background: This study examines childhood cancer survival rates and prognostic factors related to survival in the majority Hispanic population of South Texas (STX), whereas most other population studies in childhood cancer survival focus on populations with relatively few Hispanics. **Methods:** The population-based cohort study used Texas Cancer Registry data (1995-2017) to examine survival and prognostic factors. **Results:** The 5-year relative survival rate for STX cancer patients diagnosed at 0–19 years was 80.3% for all races/ethnicity. Hispanics had statistically significant lower 5-year relative survival rates than non-Hispanic Whites (NHW) for male and female together diagnosed at age ≥ 5years. When comparing survival among Hispanics and NHW for the most common cancer, acute lymphocytic leukemia (ALL), the difference was most striking in the 15-19 years age range, with 47.7% Hispanic patients surviving at 5 years compared to 78.4% of NHW counterparts. The multivariable-adjusted analysis showed that males [hazard ratio (HR): 1.13], patients diagnosed at age < 1 year (HR: 1.69), at 10–14 year (HR: 1.42), or at 15–19 years (HR:1.40), and Hispanics (HR: 1.38) had significantly increased mortality risk compared to the corresponding counterparts for all cancers. **Conclusions:** STX Hispanics had lower 5-year relative survival than NHW especially for ALL. Male gender, diagnosis at age < 1 year or 10–19 years were also associated with decreased childhood cancer survival. Despite advances in treatment, Hispanics lag significantly behind NHW. Further cohort studies in STX are warranted to identify additional factors affecting survival and to develop interventional strategies.

EXPLORING THE ROLE OF 4-THIAZOLIDINONE DERIVATIVES AS POTENTIAL COX-2 INHIBITORS AND FREE RADICAL SCAVENGING AGENTS

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Background: Cyclooxygenase-2 (COX-2) and free radicals has become an important target in the management of various pathological conditions including cancer and inflammation. The pyridine or thiazolidinone has become an emerging

scaffold in the drug design and development of COX-2 inhibitors and free radical scavenging agents. 4-Thiazolidinone clubbed pyridine may potentiate each other activity and can emerge as a promising scaffold in the treatment of inflammation/cancer. **Methods:** The present work reports synthesis and screening of 4-thiazolidinone-pyridine hybrids with substituted arylidene containing electron-donating group at 5th position. The compounds were screened for their *in-vivo* anti-inflammatory activity using carrageenan-induced rat paw edema. The antioxidant activity of the compounds was determined by the DPPH method. The compounds were also screened for their ADMET properties. Furthermore, the compounds were docked against COX-2 (PDB ID: 3LN1) using AutoDockTools version4.2.2. **Results:** The results showed that compounds bearing 2,5 dimethoxy group are found to be active and possessed the highest docking score with value of -8.0. However, the compound-bearing nitro group was found to be carcinogenic while the former ones showed good ADMET properties. The antioxidant of the compounds bearing 2,5 dimethoxy was found to be excellent than other analogues. **Conclusions:** The 4-thiazolidinone-pyridinehybridsbearing 2,5 dimethoxy group showed good pharmacological and ADMET profile and can emerged as promising COX-2inhibitor.Keywords: COX-2 inhibitors, inflammation, 4-thiazolidinonepyridine.

VITAMIN D DEFICIENCY AMONG CHILDREN AND ADOLESCENTS LIVING IN SUNNY SOUTH TEXAS

Yoscelina E. Martinez-Lopez, Margarita Faz, Beatriz Tapia, Juan C. Lopez-Alvarenga, and Francisco J. Cervantes

Patient Care

COMPLEX GYNECOLOGY CLINICS

Rivas, S; Serapio, E; Ogburn, J; Ronnau, J; Vega, A; Tanguma, A; Contreras, A.
Affiliations: UTRGV, AHEC

Purpose: The Area Health Education Center (AHEC) Complex Gynecology Clinic aims to reduce the shortage of women's primary care providers in rural and medically underserved communities. The Complex Gynecologic clinic provides high quality-evidence based care to women at low or no cost regardless of immigration status, socioeconomic status, educational attainment, and age who might otherwise be unable to receive much needed care in other sites in the RGV.
Description: Some of the services offered, via grant funding, include preventive services such as well women exams, cervical cancer screening, and family planning. As well as work up and treatment for acute complaints. The clinic is also equipped with an ultrasound machine which can be used for diagnosis of gynecologic pathology and pregnancy confirmation and dating. Our community health worker helps patient apply to financial assistance programs, community assistance programs, and Covid-19 relief programs. The primary objective is to provide preventive services to reduce risk for future adverse health outcomes and minimize need for interventions to women in rural and underserved areas.
Partners: Area Health Education Center Program –funding Healthy Mujeres Grant–funding Family Planning Grant –funding Title X-Funding
Looking Ahead: The Clinic has helped to facilitate surgical and medical treatment for patients by providing low cost services and help navigating the complex medical system. Our next steps incudes expansion of the clinic as patient load increases.

OUTCOMES OF HYPOFRACTIONATED RADIATION THERAPY IN LOCALLY ADVANCED NON-SMALL CELL CARCINOMA LUNG : A SINGLE INSTITUTIONAL EXPERIENCE

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Abstract
Introduction: Radical treatment in locally advanced non small cell carcinoma lung presents a management dilemma in patients with compromised performance status. Hypofractionated EBRT resolves this by confering high efficacy while avoiding excessive early toxicity. **Objectives:** To evaluate the efficacy and tolerance of hypofractionated radiotherapy in locally advanced lung cancer patients with compromised performance status. **Methods:** From January 2019 to January 2020, 62 patients were enrolled to receive hypofractionated radiotherapy with 40Gy in 16 fractions with 5 fractions per week (2.5Gy per fraction) because of compromised performance status. Follow-up was conducted at 6 weeks and 3 months for symptomatic and radiological response (RECIST Criteria 1.1). All results were evaluated statistically. **Results:** Mean age was 72.7years (± 6.66) with 66.12% (n=41) above 70 years and 85% in ECOG PS 3. Out of 61 patients, 20% had complete response, 75% had partial response and 3% had stable disease at 6 weeks which progressed to 33% with complete and 62% with partial response at 3 months. 85% achieved symptom palliation. Radiation pneumonitis of grade 2 and above war observed in 60.65% and 62.29% and esophagitis of grade 2 and above was observed in 40.98% and 13.11% at 6 week and 3 months respectively. **Conclusions:** Hypofractionated RT confers the benefit of avoiding excessive early toxicity while maintaining high efficacy and be a finer alternative in patients with compromised performance status and/or advanced age.
Keywords: Hypofractionated radiotherapy, performance status

A SURVIVAL ANALYSIS OF HIGH-GRADE GLIOMAS IN SUB-HIMALAYAN POPULATION INCLUDING THE TIMES OF LOCKDOWN DURING COVID 19 PANDEMIC: A SINGLE INSTITUTIONAL EXPERIENCE

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Background and Objectives: High Grade Gliomas are categorised as Grade III and IV and have high mortality rate with poor prognosis. How we should adopt clinical practice in neuro-oncology during Covid 19 Pandemic is another area of scientific exploration . Hypofractionated radiotherapy protocols can be easily utilised in high grade gliomas during Covid 19 pandemic. **Materials and Methods**: Retrospective analysis of 147 patients with diagnosis of high-gradegliomas between January 2009 till December 2020 including Covid-19 pandemic lockdown time was done. Age, gender, KPS, symptoms, extent of surgery and use of concurrent temozolamide, were evaluated using univariate and multivariate analysis. Overall Survival was determined using the Kaplan Meir method. **Results:** Glioblastoma multiforme being the most common brain tumor (82.3%) in all high-grade gliomas. Near total or total excision was done in 83.7% of cases The median dose of EBRT delivered was 60Gy. 75.5% patients were treated with concurrent and adjuvant chemotherapy. 29.2% patients were treated during Covid 19 pandemic lockdown time. The median overall survival was 15.9 months. The 1 year Overall survival was 67.8%, and 3 year OS was 6.4%. Out of 43 patients treated during covid pandemic time, 62.7% are alive and on follow up. **Conclusion:** The results of survival analysis demonstrated the benefit of adding radiation with concurrent and adjuvant temzolamide in high grade gliomas including covid 19 during lockdown time. Hypofractionated radiotherapy with concurrent temozolamide is safe during the Covid 19 pandemic.

Translational Science

HPV IMPRINTS IN WESTERN INDIA: THE OVERLOOKED CRITERIA FOR CANCER PROFILING

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Abstract

Background: In India, HPV infection detection for cancer-typing has been largely evaded. Especially, data on prevalence of HPV types other than the highly prevalent HPV 16 and 18 are lacking, particularly from the western region. Thus, present study aimed to evaluate prevalence of HPV strains in three most prevailing cancers in India i.e. cervical, oral and oropharyngeal cancer. **Materials & methods:** DNA was isolated from tissue samples of 400 cervical cancer cases, 127 oral cancer cases and 75 oropharyngeal cancer cases and endpoint PCR was performed using degenerative primers MY 09/11, GP 5+/6+ and CP I/II. TS-PCR was conducted to detect HPV 16, 18, 31, 33, 45, 52, 58, 6 and 11. **Results:** Overall HPV infection was observed in 87% cases of cervical cancer, 12.5% of oral cancer and 26.7% of oropharyngeal cancer using degenerative primers. HPV 16(72.5% in cervical cancer, 1.33% in oropharyngeal cancer), HPV 18(14.8% in cervical cancer)and HPV 45(2.3% in cervical cancer)were observed to be comparatively higher than the other HPV types. All the HPV types except HPV 11 were observed to be present in the studied cohort. HPV was also associated with younger age, well differentiated tumors with no lymph node metastasis. **Conclusion:** Prominent prevalence of HPV infection was noted in studied population. The study represents need of awareness for HPV screening at clinical set-ups which will lead to upgraded profiling of cancers and better disease management. Moreover, current study provides supportive data for initiation of HPV vaccination programs in India.

VARIANT OF FII GENE PLAYS A CRITICAL ROLE IN COAGULATION POTENTIAL IN MEXICAN-AMERICANS

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Background: Disruption in the balance between coagulation and bleeding can result in varying phenotypes such as hypercoagulability and can lead to the development of cardiovascular disease. In our study utilizing extended families of Mexican-Americans from South Texas, we performed a search for protein-altering variants influencing coagulation potential. **Methods:** Mexican-Americans in the study were genotyped using Illumina-(human)-exome-24 chip to screen for protein-altering variants. Variants were analyzed for their association with FII activity, aPTT, and PT. Linear-mixed-model analysis was performed to estimate trait heritabilities and to interrogate single nucleotide variations (SNV) for evidence of genetic association. To control for multiple testing, associations are considered significant if their p-value falls below the Bonferroni-adjusted significance level. **Results:** Heritability-estimates for FII, aPTT, and PT were found highly significant with estimates of 0.49, 0.49, and 0.54 (for all, p<1.0E-10) (Table). All three traits were significantly associated with the same SNV (rs143064939) located on Chromosome 11 leading to a 1628G>T in the FII-gene, F2(for all, p<9.0E-07). This SNV was found to have a large effect-size on each trait. **Conclusion:** Individuals with this SNV, Prothrombin-RGV, consistently present with lower levels of FII activity and correspondingly prolonged aPTT and PT. Carriers require increased

coagulation time, suggesting a potential protective role of this inherited variant in the development of venous thromboembolism (VTE) and possibly arterial thromboembolism (ATE). This variant is most frequently found in populations of Mexican origin and may be a genetic determinant in individual variability concerning coagulation potential.

NATURAL REMEDIES TO COMBAT ABERRANT HALLMARK SIGNATURES INCLUDING ALTERED GLYCOSYLATION IN ORAL CARCINOMA

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Abstract

Background: Tobacco associated oral cancers remain a major concern in India with higher incidence and mortality making it an Indian-centric burning issue. To combat this dreadful disease, we investigated effects of certain natural compounds on the hallmark signatures including glycosylation transcripts levels in oral carcinoma. **Methods:** The tongue carcinoma cells-SAS cells were treated with tobacco compounds, natural compounds and Cisplatin. RNA was isolated from the cells and converted to cDNA. RT-qPCR was performed to evaluate expression levels of various genes. **Results:** The treatment of tobacco compounds resulted in similar pattern of altered makers (ST3GAL1, NEU3, FUT5, FUT6, MMP2, BCL2) as observed in tobacco habituated patients. The treatment of Curcumin resulted in down regulation of FUT8 and MMP2 which are known to have a significant association with disease progression and metastasis. Furthermore, Curcumin treatment also resulted in up regulation of the good prognostic glycosylation transcript marker i.e. FUT3 showing its protective effect against the tumor invasion and metastasis. Butein treatment resulted in the down regulation of the worst prognostic indicators i.e. FUT8 and MMP2 in a dose dependent manner. Piceatannol treatment showed better protective effects via down regulation of the markers related to the aggressive disease progression (ST3GAL2, FUT5, FUT8, MMP2, VEGFC). **Conclusion:** The study provides novel approach of targeting aberrant hallmark signatures including glycosylation with natural compounds which may open the possibility of promising therapeutic strategies using natural compounds alone or in combination with other conventional therapies to alleviate the present scenario of this dreadful disease in India.

MOLECULAR BASIS FOR THE PHARMACOLOGICAL ACTIVITIES OF PIPERLONGUMINE AGAINST BREAST CANCER: ROLE OF GLUCOSE IMPORT, ROS, NF-KB AND lncRNAS

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Background: Piperlongumine (PL, piplartine) is an alkaloid derived from the *Piper longum* L. (long pepper) root. The activities PL against breast cancer and the underlying mechanism is not thoroughly investigated. **Aim**: We examined the anti-cancer activities of PL against breast cancer cells. The molecular basis for the pharmacological activities of this alkaloid was also examined. **Methods:** The breast cancer cell lines such as MCF-7,T-47D,MDA-MB-231,MDA-MB-468 and MDA-MB-453 were used during the study. We used MTT assay, clonogenic and soft agar colony formation assay for cytotoxicity. The cell cycle analysis, phosphatidylserine externalization assay, measurement of mitochondrial membrane potential, AO/PI and DAPI staining, and DNA laddering was used for apoptosis. The western blot analysis was performed to examine the expression pattern of tumorigenic proteins. Other parameters used were the intracellular detection of ROS, immunocytochemistry for NF-κB andGLUT-1 activation, wound healing assay for cell migration, and real-time PCR for lncRNA expression. We also evaluated if PL can enhance the efficacy of doxorubicin in swiss albino mice implanted with Ehrlich Ascites Carcinoma (EAC) cells and metabolic parameters were also examined in serum of mice. **Results:** PL

inhibited proliferation and suppressed the long-term as well as soft agar colony formation of breast cancer cells in a dose dependent manner. PL induced ROS generation and accumulation of cells in sub-G1 phase, mitochondria mediated apoptosis in cancer cells as revealed by the presence of fragmented nuclei, PARP activation, loss of mitochondrial membrane potential, chromatin condensation, DNA laddering and suppression in the expression of cell survival proteins.PL reduced glucose import and modifies the expression of glucose and lactate transporter in breast cancer cells. The amide alkaloid suppresses the TNF-α induced NF-κB activation and modulate the lncRNAs such as MEG-3, GAS-5 and H19expressioninbreast cancer. In mice model, PL was found to synergize with doxorubicin by reducing the size, volume and weight of the tumor. With an increase in the concentration of PL, the serum cholesterol and triglyceride levels were decreased while there was increase in the serum level of glucose in EAC bearing mice. **Conclusion:** PL exhibit potential against breast cancer. Further, PL enhances the efficacy of doxorubicin in EAC mice model. The modulation of lncRNAs, NF-κBand glucose import may contribute to the activities of PL against breast cancer.

NON-ALCOHOLIC FATTY LIVER DISEASE AND HEPATOCELLULAR CARCINOMA RISK ASSOCIATED GENE EXPRESSION PHENOTYPES IN HISPANICS

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Background: Non-alcoholic fatty liver disease (NAFLD) is a state of metabolic dysregulation characterized by excessive lipid accumulation into the hepatocytes (hepatic steatosis). It is a major determinant of risk for hepatocellular carcinoma (HCC). Hispanics in south Texas exhibit one of the highest incidences of NAFLD and HCC in the United States. **Methods:** We used an induced pluripotent stem cell (iPSC) based hepatocyte (HEP) model to identify high lipid stress induced transcriptomic changes in HEPs to better understand hepatic steatosis associated HCC risk. Well-characterized, iPSC differentiated functional HEPs generated from six participants in our San Antonio Mexican American family study were challenged with high lipid conditions in in-vitro culture. The lipid challenged and vehicle treated HEPs were then analyzed for cellular lipid accumulation, fibrosis, and genome wide gene expression by mRNA-sequencing. **Results:** Quantitative measures of cellular neutral lipids and fibrosis marker (COL1A1) were significantly increased in lipid challenged HEPs. These measures also showed a high correlation (r 2 ≥70%) with individual's in-vivo liver fat. Genome wide differential gene expression analysis identified 78 genes that were significantly differentially expressed (DE) between lipid challenged and vehicle treated HEPs. Functional annotation analysis showed significant enrichment of DE genes in liver hyperplasia/hyperproliferation functions (27 genes; p-value 2.0x10-2 to 9.2x10-2), and included several genes (PDRG1, PLIN2, CFHR3, ANXA2P3, HBA1, HBA2, HBB) whose altered expression was shown to be associated with HCC risk. **Conclusions:** We have identified several genes associated with risk for HCC for which expression was significantly dysregulated by a high lipid stress challenge in HEPs.

THE DEVELOPMENT OF FVIII INHIBITOR IN HISPANIC AMERICAN PATIENTS WITH HEMOPHILIA A CRITICALLY IMPACTS COAGULATION POTENTIAL

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Background: Hemophilia A (HA) is caused by deficiencies in plasma-FVIII and heterogeneous factor-VIII-gene mutations that impair intrinsic coagulation amplification. In severe hemophilia A patients (HAPs), FVIII infusions are begun at toddlerhood to prevent hemarthrosis induced crippling. However, approximately 30% of these patients develop FVIII inhibitors. Gain-of-function mutations in the common pathway of coagulation increases coagulation potential and decreases bleeding and FVIII-utilization in HAPs which should decrease FVIII-inhibitor-risk. We identified loss-of-function mutations in this pathway which decrease coagulation-potential as they increase FVIII-inhibitor risk in HAPs. **Methods:** We screened Mexican-American-pedigrees of the South-Texas-Family-Study (STFS) for protein-altering-variants. Subjects were genotyped using Illumina-exome-24-chip. Protein-altering-variants were analyzed for associations with FII:C, PT, and aPTT. Linear-mixed-model-analyses was performed to estimate trait-heritability and examine single-nucleotide-variations (SNVs) for gene association. Significant associations' p-values fell below Bonferroni-adjusted significance level. **Results:** Heritability-estimates for FII:C, aPTT, and PT were highly-significant with p-values of 0.49, 0.49, and 0.54 (for all, p<1.0E-10)(Table). Hemostasis-traits were significantly associated with chromosome-11 SNV (rs143064939)—1628G>T in the FII-gene (F2)—which encodes 543R>L and has a large effect-size on each trait (for all, p<9.0E-07). Their effect are physiologically-consistent in that individuals with 1628G>T have lower FII:C levels but correspondingly prolonged aPTT and PT times. **Conclusion:** We hypothesize that FII-543R>L (Prothrombin-RGV) likely contributes to the high-incidence of FVIII-inhibitor-development in HA-patients of Mexican-ancestry, resulting in higher risk of developing anti-tFVIII-antibodies than patients without the variant. Patients with the RGV variant are likely to bleed more which can require surgery, further increasing the development of FVIII inhibitor development.

INHIBITION OF LIPID ACCUMULATION IN HEPATOCYTES BY UNIQUE ASHWAGANDHA EXTRACTS

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INTRODUCTION: Ashwaganda (*Withania Somnifera*) is a popular ayurvedic herb, trusted for a variety of health benefits in Indian traditional home medicine system. Steroidal lactones, Withaferin A (Wi-A) and Withanone (Wi-N), have been characterized as its major bioactives with a variety of bioactivities. We investigated the effect of Ashwagandha extracts on steatosis, abnormal retention of fat within a cell or organ that often affects liver as non-alcoholic fatty liver disease (NAFLD). **METHODS:** We prepared extracts from Ashwagandha that varied in their Wi-A and Wi-N content. Cytotoxicity of these extracts on human hepatocytes (Huh-7 and Suit-2) was evaluated by cell viability assays. Nontoxic doses were used to treat the cells subjected to activated lipid accumulation by palmitic acid (PA). The lipolygenesis was evaluated by Oil Red O and triglyceride (TG) assays, and the expression of molecules involved in this preocess. **RESULTS AND DISCUSSION:** The four kinds of extracts with different amounts of total withanolides and Wi-A:Wi-N ratio were generated. Cells were treated with PA to induce lipid accumulation. We found that in cells pre-treated with specific Ashwahandha extracts, TG accumulation was decreased. Of note, Sterol regulatory element-binding protein-1c (SREBP-1c), and its downstream effector-Fas, the key regulators of lipogenesis showed downregulation in specific extract-treated cells. Furthermore, the expression of PPARγ, a key factor involved in hepatic lipogenesis, showed decrease in cells treated with some of these extracts. **CONCLUSION:** Ashwagandha extracts may provide a useful natural resource with anti-steatosis activity, maintaining liver health and NAFLD prevention.

DEVELOPMENT OF A NOVEL NIR FLUORESCENT PROBE FOR BREAST CANCER IMAGING

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Background: Early-stage detection is crucial for successful breast cancer treatment and can significantly reduce breast cancer associated death rates. There are several diagnostic approaches available for early breast cancer diagnosis but lack tumor specificity and expose patients with radiation. Therefore, there is a crucial need to develop newer and safer imaging modalities. Indocyanine green (ICG), an FDA approved Near InfraRed (NIR) fluorescent probe-based imaging for early cancer detection and image guided surgery, has gained noticeable attention for the clinical applications as it has high sensitivity, low cost, and real-time visualization/imaging capabilities without ionizing radiation. However, ICG has several limitations associated with its photostability, high concentration toxicity, and short circulation time. To overcome this hurdle, we have recently engineered a novel poly (vinyl pyrrolidone) and tannic acid (PVP-TA) based nanosystem to carry ICG to the cancer cells/tissues. **Methods:** Pursuing the novel nanotherapy approach, our lab has developed PVP-TA based ICG (PVT-ICG) fluorescent nanoparticles via self-assembly process. Our optimized PVT-ICG nanoformulation was further characterized for its physicochemical properties. An IVIS imaging system was used to measure NIR fluorescence and cancer cell targeting of PVT-ICG in vitro and in vivo. **Results:** PVT-ICG demonstrated improved photostability, fluorescent intensity, internalization and cancer targeting compared to free ICG in both breast cancer cells and mouse model. **Conclusions:** Collectively, our findings suggest that this NIR fluorescent probe PVT-ICG has great potential for becoming a novel and safe imaging modality for breast cancer cells/tumors which can result in early diagnosis leading to improved cancer management.

Biomedical Science

ON THE ROLE OF HEMOSTASIS VARIABLES IN CARDIOMETABOLIC OUTCOMES

Alberto D. Lopez, Kanisha Patel, Vincent P. Diego, Marcio A. Almeida, John Blangero, and TOMMY E. HOWARD

MORTAPARIB^{PLUS}- A NOVEL ANTICANCER SMALL MOLECULE ABROGATING MORTALIN-p53 INTERACTION IN CANCER CELLS

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Abstract

Background: The cessation of tumor cell growth through cell cycle arrest and apoptosis is determined by p53, a tumor suppressor protein. However, the interaction between mortalin-p53 within cytoplasm/nucleus leads to the inactivation of p53 transcriptional activation function. The disruption of mortalin-p53 complex has been suggested as an approach for developing a potential anticancer drug. **Methods:** A screening of a high-content chemical library was performed to determine a molecule with mortalin-p53-interaction disrupting characteristics. After four-rounds of visual assays, we discovered a triazole derivative (4-[(1E)-2-(2-phenylindol-3-yl)-1-azavinyl]-1,2,4-triazole, named Mortaparib^{Plus}) with a potential ability of disrupting mortalin-p53-complex. In this study, we recruited two types of cells (different p53 status and point mutation), Colorectal Cancer Cells [HCT116 (p53WT) and DLD-1 (p53 (p53S241F)] and Luminal A Breast Cancer [MCF-7 (p53WT) and T47D (p53L194F)]. We further validated the activity of Mortaparib^{Plus} by bioinformatics/experimental analyses. **Results:** Through bioinformatics analysis, we discovered that Mortaparib^{Plus} has potential to block the binding site of mortalin on p53, thus, preventing the formation of mortalin-p53 complex. Immunoprecipitation analyses showed that Mortaparib^{Plus} abrogated the mortalin-p53 complex formation and caused growth arrest/apoptosis (via activation of p21WAF1, BAX, and PUMA) in HCT116, DLD-1, and MCF-7 cells. Furthermore, Mortaparib^{Plus} posed a cytotoxic effect to cancer cells through various mechanisms (inhibition of PARP1, up-regulation of p73 proteins, downregulation of mortalin and CARF proteins). In contrast, we found that, despite the hyperactivation of PARP1 (PAR accumulation and loss of ATP) as an alternative tumor suppression mechanism, Mortaparib^{Plus}-treated T47D cells exhibited signs of neither complete apoptosis nor PAR-Thanatos. Such response was associated with the failure of Mortaparib^{Plus} to inhibit the formation of AIF-mortalin complexes. **Conclusions:** Mortaparib^{Plus} is proposed as a potential multimodal small molecule for cancer treatment that requires further extensive laboratory and clinical studies.

LONG NON-CODING RNA (lncRNA) AS A NEW BIOMARKER FOR HEPATOCELLULAR CARCINOMA (HCC) DRUG RESISTANCE

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Background: Hepatocellular carcinoma (HCC) is the 4thleading cause of cancer-related deaths worldwide and the 6thmost common cancer worldwide. When HCC progresses to advanced stages, drug resistance becomes a major hurdle and leaves

clinicians with limited therapeutic options. Long non-coding RNAs (lncRNAs) have shown to promote drug resistance in various cancers. The goal of our research is to explain the molecular role of lncRNAs in HCC drug resistance and compile a comprehensive list of studied lncRNAs involved in HCC drug resistance. **Methods**: To compile a list of lncRNA involved in HCC drug resistance we performed an advanced search onLnc2Cancer, a database that provides experimentally supported associations between lncRNA and human cancer, using the following filters: "hepatocellular carcinoma", "drug clinical application", "lncRNA", "all biological function", and "all regulatory mechanism." **Results:** We identified 12 lncRNAs that are involved in HCC drug resistance: Metastasis Associated Lung Adenocarcinoma Transcript 1 (MALAT 1), Keap1 Regulation-Associated LncRNA (KRAL), Transcribed Ultra-conserved Region 338 (TUC338), Long intergenic non-protein coding RNA, regulator of reprogramming (linc-ROR), Linc-VLDLR, Highly Upregulated in Liver Cancer (HULC), HCC associated long non-coding RNA (HANR), LncRNA Regulator of AKT Signaling Associated with HCC and RCC (LncARSR), Taurine up-regulated gene 1 (TUG1), H19, NR2F1 Antisense RNA 1 (NR2F1-AS1), and HOX Transcript Antisense RNA (HOTAIR). **Conclusions:** Our review demonstrates that lncRNAs involved in HCC drug resistance participate in various mechanistic categories such as autophagy, epithelial-mesenchymal transition, and efflux pump upregulation. There is a need to uncover novel lncRNA biomarkers for both the early detection of HCC and to create drug strategies for clinicians when predicting chemoresistance.

PIPERINE ENCOURAGES APOPTOSIS IN HUMAN CERVICAL ADENOCARCINOMA CELLS THROUGH ROS GENERATION, DNA FRAGMENTATION, CASPASE-3 ACTIVATION AND CELL CYCLE ARREST

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Background: IL-13 is a prominent Th2 cytokine involved in immune response to extracellular pathogens and allergic diseases. Genome-Wide Association studies showed that several single nucleotide polymorphisms (SNPs) that localize to the coding, noncoding, and regulatory regions of *IL13* locus are related to diverse diseases. For example, rs1295686, rs20451 and rs848 are associated with allergic diseases, atopic dermatitis, and IgE levels, respectively. However, the functional mechanisms by which these SNPs modulate *IL13* expression are poorly understood. A powerful method to determine the role of SNPs is to assess allelic expression imbalance (AEI), which is the differential expression of one allele with respect to the other in heterozygous donors. **Methods:** *IL13* haplotypes were constructed using publicly available data through 1000 genomes with Haploview 4.1. We obtained peripheral blood naïve CD4+ T cells from heterozygous donors (rs848C/A), *in vitro* differentiated them to Th2 lineage and reactivated with PMA/A23187. RNA was purified and *IL13* transcripts quantified. The region encompassing rs848 was PCR amplified and sequenced. AEI was calculated using PeakPicker v.2.0. **Results:** Using SNP data from worldwide populations (N=1,843), we defined two major haplotypes in the *IL13* transcribed region: H-1 (CGGCC, frequency=0.68) and H-2 (TAAAT, frequency=0.29) based on rs1295686, rs20541, rs1295685, rs848 and rs847, respectively. All these SNPs were in high linkage disequilibrium (r2=0.86-1.00) in most populations. Following differentiation of CD4+ T cells, 52.4% of the Th2 cells expressed IL-13 and *IL13* mRNA increased after reactivation. Allele-specific transcript quantification in Th2 CD4+ T cells showed that disease associated rs848A allele was expressed at higher levels when compared to rs848C allele. **Conclusions:** SNPs in *IL13* transcribed region associated with allergic/inflammatory diseases were all in high LD. AEI at the *IL13* locus provides a mechanistic basis for increased disease susceptibility and could potentially lead to identification of novel targets for personalized medicine.

FAT DISTRIBUTION AND DIFFERENTIAL EFFECTS ON METABOLIC LIVER FAT INFILTRATION IN YOUNG MEXICANS IN REYNOSA, MEXICO: A COLLABORATIVE STUDY ACROSS THE U.S.-MEXICO BORDER

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Metabolic-associated fatty liver disease (MAFLD) is a descriptive term for NAFLD (Nonalcoholic) physiopathology associated with obesity. The age of onset linked to body fat distribution is poorly studied. Therefore, we aimed to assess the body fat effect on liver fat infiltration and stiffness (LSt) mediated by insulin resistance (IR). After obtaining informed consent, five hundred freshmen from two universities in Reynosa, Mexico (UMAN & UAT) were enrolled in the study. They completed a questionnaire focused on familial cardiometabolic risk and provided anthropometric measurements. In a subset of N=200, we obtained blood samples for biochemical measurements, body fat percentage (BF%) by bioimpedance, LSt (kPa), and fat infiltration (Continued Attenuation Parameter, CAP) by elastography. We used mediation analysis with structural equation models (Stata v16.1) to determine the relationship between BMI, BF%, and abdominal obesity with IR and liver stiffness and fat infiltration. The term "->" means 'explain' or 'cause'. We found that AO->IR (standardized values b=0.53, p=0.005), AO->CAP (b=0.69, pIR (b=0.23, p=0.007). BMI did not have an effect on CAP or IR. Also, BMI->LS (b=0.47, p=0.05) but AO->LS was absent. Finally, there was a bidirectional relationship between LS and IR [LS->IR (b=0.18, p=0.001), and IR->LS (b=0.27, p=0.001)]. Our findings suggest the adipose tissue measured as AO or BMI showed different phenotypic effects on liver fat infiltration or stiffness. Visceral fat had a direct effect on IR, meanwhile, subcutaneous adipose tissue was associated with liver stiffness. Our findings suggest that early age interventions should be focused on reducing visceral fat deposition.

IDENTIFICATION AND CHARACTERIZATION OF ANTICANCER POTENTIAL OF A NOVEL SMALL MOLECULE, MORTAPARIB^{MILD}

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Background: The development of new anticancer drugs and treatment modalities form a priority research field. The tumor suppressor protein p53 is frequently mutated or functionally inactivated in a large variety of cancers. Its inactivation by mortalin, a member of the heat shock 70 protein family, has been shown to contribute to carcinogenesis. The small molecule inhibitors of mortalin-p53 interactions have been shown to reactivate p53 yielding apoptosis/growth arrest in cancer cells. Therefore, abrogators ofmortalin-p53 interaction have emerged as possible new therapeutic anticancer reagents. **Methods:** We performed chemical library screening based on the imaging of mortalin-p53 interaction, leading to the identification of a novel triazole derivative4-[(4-amino-5-thiophen-2-yl-1,2,4-triazol-3-yl) sulfanylmethyl]-N-(4-methoxyphenyl)-1,3-thiazol-2-amine. Bioinformatics and experimental analyses were conducted to assess the anti-cancer potency of this molecule, named Mortaparib^{mild}. **Results:** Mortaparib^{mild} could bind to mortalin and p53 on their interaction sites. It caused downregulation of mortalin and PARP1 expression. However, a higher dose of Mortaparib^{mild} was required for inducing apoptosis/growth arrest in cancer cells as compared to Mortaparib and

MortaparibPlus, the previously reported molecules with similar properties [Elwakeel et. al. (2021) Cancers 13:3043; Sari et.al. (2021) Cancers 13:835 and Putri, et.al. (2019) J Exp Clin Cancer Res38:1]. It was also effective for triggering apoptosis/growth arrest in p53nullcancer cells suggesting its p53-independent activities. Molecular characterization of p53-dependent and independent Mortaparib^{mild} activity and their relevance to cancer therapy will be discussed. **Conclusion:** Mortaparib^{mild} is a new small molecule capable of inhibiting mortalin and PARP1and inducing apoptosis in cancer cells.

Keywords: anticancer molecule, cancer, mortalin-p53 interaction

MOLECULAR INSIGHTS TO THE DOSE-DEPENDENT ACTIVITIES OF ASHWAGANDHA EXTRACTS

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Background: Stress is an inevitable component of life. Several herbs are known for their health-supporting effects that range from treatment of stress, common cold to cancer. We investigated the dose-dependent effect of Ashwagandha (*Withania somnifera*) extracts on human normal and cancer cells, and have attempted to resolve the molecular mechanisms of their antistress activities. **Methods**: Ashwagandha extracts were chemically profiled by HPLC. Cytotoxicity was determined by viability assays. Biochemical and immunoimaging assays were performed using specific antibodies. **Results:** Human normal cells treated with low doses of the leaf extract or purified with anolides (Withaferin A or Withanone) showed no toxicity. Such non-toxic doses were selected for anti-stress, neurodifferentiation and neuroregenerative assays. We found that whereas normal cells exposed to oxidative and UV stresses showed poor viability/growth arrest/apoptosis, cells treated with low doses of Ashwagandha extracts were protected. Brain-derived cells exposed to glutamate and scopolamine stresses showed protection and strong differentiation as marked by expression of neurodifferentiation markers. Muscle-derived cells cultured in low doses of extract showed muscle differentiation as marked by expression of muscle differentiation markers. Most recently, using computational tools, we examined potential of Ashwagandha for anti-SARS-CoV-2 virus activity, and found that most of the Ashwagandha Withanolides have potential to block cell surface receptors (ACE2 and TMPRSS2) that are involved in entry of virus to human cells. Furthermore, Ashwagandha treated cells showed decrease in ACE2 and TMPRSS2 expression suggesting its potential in blocking virus infection. **Conclusion:** Ashwagandha extracts and withanolides possess useful bioactivities.

FOLATE RECEPTOR MEDIATED TARGETING ENHANCES SELECTIVE CYTOTOXICITY OF ASHWAGANDHA DERIVED DRUGS TO CANCER CELLS

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Background: Folate receptors (FRs) have been shown to be overexpressed on the surface of a variety of cancer cells and their expression are limited in normal cells and tissues. Since FR strongly binds to folic acid (FA), FA-functionalized nanocarriers have been proposed as a reliable strategy for delivery of anticancer drugs. We have earlier reported that the alcoholic extract of Ashwagandha leaves (i-Extract) and its major cytotoxic component, Withaferin A (Wi-A), have cancer cell killing activity. In the present study, we synthesized a FR-targeting i-Extract nanocomplex (FRi-ExNC) and a FR-targeting

Wi-A nanocomposite (FRWi-ANC), by conjugating FA to polyethylene glycol and amphiphilic nanoframeworks, respectively. We investigated their anticancer potentials in *in vitro* and *in vivo* assays. **Methods:** Selective cellular uptake of FRi-ExNC and FRWi-ANC were evaluated by immunofluorescent microscopy. Cytotoxic effect of FRi-ExNC and FRWi-ANC in cancer cells were detected by assays including cell viability, apoptosis and biochemical determination of proteins involved in these phenotypes. The antitumor efficacy of FRi-ExNC and FRWi-ANC were investigated by *in vivo* tumor formation assays in nude mice. **Results:** We found that FRi-ExNC and FRWi-ANC caused stronger cytotoxicity as seen by induction of apoptosis. It was confirmed by cell cycle and protein expression analyses. *In vivo* tumor growth assays for subcutaneous xenografts in nude mice also revealed significantly enhanced suppression of tumor growth in the treated groups. **Conclusions:** Our results suggested that these two kinds of nanoparticles serve as useful nanomedical tools for selective targeting of drugs to the cancer cells and enhanced anticancer activity.

STRESS-INDUCED CHANGES IN CARF EXPRESSION DETERMINE GROWTH ARREST, APOPTOSIS, OR MALIGNANT TRANSFORMATION IN CULTURED HUMAN CELLS: MOLECULAR EVIDENCE AND ITS APPLICATION

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Background: CARF (Collaborator of ARF)/CDKN2AIP is an essential protein, first cloned as a binding partner of ARF. It was subsequently shown to interact with p53, HDM2 proteins and regulate growth arrest and apoptosis by its multimodal mechanism of action. Overexpression of CARF caused senescence like growth arrest of cells, its knock-down triggered apoptosis. Intriguingly, malignantly transformed cells showed high level of CARF expression. Based on these Sproliferation fates; where an increase in its levels causes growth arrest/senescence, but beyond a threshold it activates carcinogenesis. **Methods:** We utilized in vitro cell culture models using retrovirus-driven expression of CARF to achieve over expression and super-expression of CARF. Analysis of CARF levels was undertaken by biochemical and imaging protocols. Cells exposed toa variety of stresses including physiological, environmental, oxidative, radiation and chemotherapeutics was examined for CARF expression and corresponding cell proliferation fates. **Results:** Induction of Senescence was seen in cells overexpressing CARF. On the other hand, cells compromised for CARF showed apoptosis, and the ones with super-expression of CARF exhibited malignant transformation. CARF expression analysis in these experimental models endorsed the concept of cell-fate determining role of CARF. **Conclusions:** We present molecular evidence of the bridging role of CARF in stress-aging-cancer phenotypes and its application in pharmaceuticals and nutraceuticals as a diagnostic and prognostic marker for stress and cancer treatments. **Keywords:** CARF/CDKN2AIP, Stress, Growth arrest, apoptosis, malignant transformation molecular mechanisms

WHOLE GENOME SEQUENCE DATA IMPLICATE RBFOX1 IN EPILEPSY RISK IN BABOONS

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Abstract

Background: Baboons exhibit a genetic generalized epilepsy (GGE) that resembles juvenile myoclonic epilepsy and may represent a suitable genetic model for human epilepsy. The genetic underpinnings of epilepsy were investigated in a baboon colony at the Southwest National Primate Research Center (San Antonio, TX) through the analysis of whole-genome sequence (WGS) data. **Methods:** Baboon WGS data were obtained for 38 cases and 19 healthy controls from the NCBI Sequence Read Archive and, after standard QC filtering, two subsets of variants were examined: (1) 20,881 SNPs from baboon homologs of 19 candidate GGE genes; and (2) 36,169 protein-altering SNPs. Association tests were conducted in SOLAR, and gene set enrichment analyses (GSEA) and protein protein interaction (PPI) network construction were performed on genome-wide significant association results (P<0.01; n= 441 genes). **Results:** Heritability for epileptic seizure in the pedigreed baboon sample was estimated at 0.76 (SE=0.77; P=0.07). A significant association was detected for an intronic SNP in RBFOX1 (P=5.92 × 10-6; adjusted P=0.016). For protein-altering variants, GSEA revealed significant positive enrichment for genes involved in the extracellular matrix structure (ECM; FDR=0.0072) and collagen formation (FDR=0.017). **Conclusions:** SNP association results implicate RBFOX1 in baboon epilepsy, a gene that plays a key role in neuronal excitation and transcriptomic regulation, and has been previously linked to human epilepsy, both focal and generalized. Moreover, protein-damaging variants from across the baboon genome exhibit a wider pattern of association that links collagen-containing ECM to epilepsy risk. These findings suggest a shared genetic etiology between baboon and human forms of GGE.

MOLECULAR INSIGHTS INTO TARGETING PKD1 FOR PROSTATE CANCER TREATMENT

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Background: Prostate cancer has a poor prognosis due to late diagnosis and ineffective multimodal clinical treatment. Efforts are underway to create strategies for resolving the abnormal expression of molecular targets implicated in disease development and progression. We previously reported that the serine threonine kinase Protein Kinase D1 (PKD1) regulates a multitude of tumor suppressor functions, including cell aggregation, motility, proliferation, and invasion in prostate cancer. Thus, PKD1 is regarded as a promising therapeutic target for the treatment of prostate cancer. **Objective:** The goal of this study was to investigate the therapeutic potential of ormeloxifene (ORM), a pharmacological modulator with well-defined PK/PD and safety profiles in humans, for PKD1 restoration in prostate cancer. **Methods:** The anticancer effect of ORM on PKD1 and associated signaling mechanisms in prostate cancer was investigated using proliferation, clonogenicity, migration, invasion, western blotting, and qPCR analysis. **Results:** In comparison to the vehicle-treated group, ORM treatment decreased prostate cancer cell proliferation, invasion, migration, and colony formation in a dose-dependent manner. In C4-2 cells, ORM treatment selectively induces PKD1 expression at both the mRNA and protein levels. Furthermore, our findings revealed that ORM efficiently suppresses MTA1 expression in prostate cancer cells. MTA1 physically interacts with PKD1 and has been shown to have an inverse correlation with it. Our results also showed that ORM treatment enhances the therapeutic efficacy of decetaxel. **Conclusion:** Taken together, these findings show that ORM has anticancer properties in prostate cancer via restoring PKD1.

ENGINEERING OF FUNCTIONALIZED CARBON NANO-ONIONS EMBEDDED BSA NANOCOMPOSITE FIBERS FOR STIMULI-RESPONSIVE DRUG RELEASE.

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Abstract

Background: Advanced drug delivery systems (DDSs)have received enormous attention in biomedical applications due to their pharmacodynamic and pharmacokinetic drug properties. For the present study, poly 4-hydroxyphenyl methacrylate (PHPMA)/CNOs(f-CNOs)inserted bovine serum albumin (BSA) nanofibers were prepared for stimuli-responsive release of Doxorubicin(DOX).Temperature and pH would be altered to study the release of DOX in acidic microenvironments. **Methods:** PHPMA were coupled with COOH-CNOs via ester coupling via the sonochemical method to produce PHPMA-CNOs (f-CNOs). Then, f-CNOs/DOX embedded BSA nanofibers were prepared at room temperature using Forcespinning. UV spectra of DOX-loaded nanofibers were studied to investigate the release profile of DOX. **Results:** The addition of f-CNOs to BSA fibers significantly increases thermal and mechanical properties (18.23 MPa). Also, fibers demonstrated long-termed thermosensitive DOX sustained-release obtaining 94% and 98.9% of drug release at 43 and 45°C respectively in pH 5.0 overa 15-day study. Cytocompatibility studies with fibroblast cells showed good cell viability, cell adhesion, and proliferation against BSA/f-CNOs nanocomposite fibers. **Conclusión:** The presented endogenous and exogenous stimuli-responsive drug delivery system could be useful in further cancer research studies and biomedical applications.

TARGETING CELLULAR SIGNALING PATHWAYS IN CANCER BY LACTOBACILLI

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Program Abstract

Purpose: Presenting *lactobacilli* therapy for cancer treatment targeting cancer signaling *Lactobacilli* as Probiotic lactic acid bacteria (LAB) are a group of fermentative gram-positive and gram-negative bacteria that produces a large number of intracellular and extracellular metabolites used in the food manufacture industry as well as complementary and alternative medicines against many diseases including cancer. **Description**: Some LAB has been found to have inhibitory activity against colon liver cancer, cancer, colorectal cancer, breast cancer, and lung cancer *in vivo* or *in vitro*. These fermentative bacteria induced the autophagy cell death either by GRP78 and Beclin-1 or by induction of Bak and Bcl-2 as well as boosted the apoptosis induction ability of 5-fluorouracil (5-FU). They also participate in the downregulation of the gene product of nuclear factor-kappaB (NF-κB), controlling the cell proliferation (Cox-2, cyclin D1) and survival (Bcl-2, Bcl-xL) which help to stop cancer. They are tested *in vitro*/*in-vivo* as whole live cells, fermentative broth, or purified molecules and found to associate with cellular signaling pathways such as the intrinsic mitochondrial pathway, Stat3/IL-6, NF-κB signaling pathway that is involved in cancer. **Looking Ahead**: The pathways associated with metabolic activities of intestinal microflora, bile acid-metabolizing bacteria colon conditions, and enhancing the host's immune response. Thus, the anticancer therapeutic potential of bacteria *Lactobacillus acidophilus, L. reuteri, L. acidophilus, and L. rhamnosus, Bifidobacterium longum and L. acidophilus, Streptococcus thermophiles, LTA-deficient L. acidophilus, Pediococcus pentosaceus FP3, L. salivarius FP25, Enterococcus faecium* FP51 could be benefited for the cancer treatment either by use of themselves bacteria or their metabolites targeting cancer signaling.

Keywords: Probiotic, *Lactobacilli*, Signaling, Cancer Therapy

PIPERINE ENCOURAGES APOPTOSIS IN HUMAN CERVICAL ADENOCARCINOMA CELLS THROUGH ROS GENERATION, DNA FRAGMENTATION, CASPASE-3 ACTIVATIONAND CELL CYCLE ARREST

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Abstract:
Background: Cancer is one of the most common destructive diseases and the second leading cause of death in humans. Among cancer, cervical cancer is the second most common malignancy among women globally. Thus, there is a continuous need to search for chemotherapeutic chemicals or naturally occurring drugs to resolve this global health problem. Piperine (1-piperoylpeperdine) is present in the fruits of black pepper (*Piper nigrum* Linn.) and long pepper (*Piper longum* Linn.). It possesses several pharmacological properties and in the present study we have evaluated its anti-cancer potential on human cervical adenocarcinoma (HeLa) cells. **Methods:** The anti-proliferative effect of piperine were investigated through some potent markers of apoptosis viz.reactive oxygen species (ROS) generation, cellular apoptosis and loss of mitochondrial membrane potential (MMP),DNA fragmentation, cell cycle kinetics, caspase-3 activity and cell migration against HeLa cells. **Results:** The results showed that piperine exposure induces apoptosis significantly in a dose-dependent manner and inhibits the growth of HeLa cells with an increase in ROS generation, nuclear condensation and delayed wound healing. In addition, piperine also encourages cell death by the loss of MMP, DNA fragmentation and the activation of caspase-3. Growth inhibition of HeLa cells was found to be associated with G2/M phase arrest and sub-G1 accumulation. **Conclusions:** The present study provides useful insight into the apoptotic potential of piperine and further in vivo and clinical studies will be needed for its validation and in the finding of more effective and least toxic regimens against cervical cancer.
Keywords: Cervical cancer, Anti-tumor, Apoptosis, Caspase-3, Cell cycle kinetics, Piperine, ROS, MMP, DNA fragmentation, Wound healing

Clinical Sciences

PERI-SPLENIC ABSCESS POST SLEEVE GASTRECTOMY IN A HISPANIC WOMAN

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Introduction: Sleeve gastrectomy (SG) is commonly carried out in patients requiring bariatric surgery. SG is a widely tolerated subspecialty procedure worldwide. Peri-splenic abscess a rare and severe complication following a SG. This case report describes peri-splenic abscess after a SG in a Hispanic Woman. **Case report:** A 49-year-old female patient presented to the Emergency Room with acute abdominal pain, hypotension and altered mental status 1 week after a sleeve gastrectomy. Her BMI at presentation was 30.4kg/m2 and she had a right upper quadrant (UQ) JP drain containing purulent material on arrival. Her laboratory values revealed leukocytosis, hypokalemia, hyperglycemia and elevated creatinine. Imaging studies were suggestive of an esophago-gastro junction (EGJ) perforation with a leak, and right and left UQ intra-abdominal abscesses. She was commenced on antibiotics and had 2 additional left UQ drains inserted. However, her imaging abnormalities persisted including worsening of the peri splenic abscess and other associated symptoms necessitating a stent placement bridging the EGJ to antrum. She was discharged home at Day 23 with the drains and antibiotics and she remains under our close observation. **Conclusion:** Peri-splenic abscess is a very rare complication of SG with only about 27 cases reported in literature. To the best of our knowledge, this is the only case reported in a Hispanic woman. Prompt recognition and appropriate management of this complication will improve morbidity and mortality as in our patient.

ASSOCIATION OF NUTRITIONAL STATUS WITH FAILURE TO COMPLETE PLANNED TREATMENT IN PATIENTS WITH HNSCC- A PROSPECTIVE COHORT STUDY IN A TERTIARY CANCER CENTRE IN NORTHERN INDIA.

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Abstract

Objectives-To determine the association between Nutritional status of patient and the ability to complete all planned treatment in Head &Neck Squamous Cell Carcinoma (HNSCC). **Materials & Methods-** This prospective cohort study was conducted at CRI, HIMS, SRHU, India between 2018 and 2020. Patients diagnosed with HNSCC and planned for cancer treatment were enrolled after written informed consent. Nutritional status was determined using- anthropometric measures and Subjective Global Assessment (SGA) scale before starting treatment. Patients were followed up for treatment details, complications and failure to complete planned treatment. Statistical analysis was performed using SPSS version 22. Data was analyzed using parametric and non-parametric tests, p value of 0.05 was considered significant. **Results-** Total 161 patients were analyzed, mean age 56.3yr (±13.27 SD), 88.2% male, 64% cT3/4 stage, 91.9% ECOG PS 0 to 2. Baseline parameters age, gender, PS, tumor subsite, stage, grade were not found to be significantly associated with failure to complete planned treatment. Mean weight was 51.76 (±12.52 SD) and 58.65 (±11.3 SD) kg (p=0.012), mean Body Mass Index (BMI) 19.36 (±4.3 SD) and 21.92 (±4.09 SD) (p=0.009), median weight loss within 6months 11% and 3% (p=0.01), median SGA score 49 and 38 (p=0.000) in patients who failed to complete treatment and who completed treatment. Percentage failure to complete treatment was found in 20%, 10.34% patients with weight ≤50kg, >50kg (p=0.12, RR=2.17); 28.95%, 8.2% with BMI <18.5, ≥18.5 (P=0.002, RR=4.56); 7.94%, 31.43% with weight loss in 6months <10%, ≥10% (p=0.001, RR=0.19), 37.5%, 10.34% with Mid-Upper Arm Circumference ≤21cm, >21cm (p=0.008, RR=5.2), 7.06%, 19.74% with SGA score <40, ≥40 (p=0.02, RR=0.31) respectively. **Conclusions-** Nutritional parameters like weight, BMI, MUAC, weight loss in 6months, and SGA score are significantly associated with failure to complete treatment. Disparities in nutritional status of patients undergoing treatment for HNSCC need to be acknowledged.

DOSIMETRIC STUDY FOR MASTECTOMY CARCINOMA LEFT BREAST CASES WITH VOLUMETRIC MODULATED ARC THERAPY (VMAT)

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Abstract

Background: Radiation therapy for breast cancer has evolved from conventional to 3-dimentional radiation therapy(3-DCRT) and through more precise IMRT and VMAT. 3-DCRTis preferred for ca breast treatment as it reduces low dose area in contra lateral lung but with the advances in radiotherapy image guided techniques can deliver precise and lower doses to OARs with better coverage. This study is aimed to evaluate the doses of PTV, heart and ipsi-lateral lung with contra lateral lung doses delivered by VMAT technique. **Method and material:** Total 10 patients of carcinoma left breast with mastectomy were selected for VMAT planning with prescription of 45 Gy/20#. Eclipse 16.1 treatment planning system was used and treatment was delivered by True Beam with 6 MV photon energy with image guidance. The VMAT technique includes the non-continuous partial arc and continuous partial arc to deliver the dose. Dose volume histogram (DVH) was used to analyze for doses of planning target volume (PTV) and organs at risk (OARs). **Results:** PTV was covered with average 94.96% of prescribed dose. The average homogeneity index was found 0.02 and average conformity index was found 0.97 for VMAT plans. Mean doses for heart were measured 14.49±2.11Gy and for V_{25Gy} 11.16±1.97Gy. Ipsilateral lung mean doses were observed 16.23±1.01 Gy, V_{20Gy} doses were 28.73±1.52Gy, V_{30Gy} doses were 14.78±2.5Gy and V_{40Gy} doses were 5.59±1.98Gy. The contralateral lung mean doses were reported 7.69±1.79Gy and V_{10Gy} 19.05±2.05Gy. Average planning target volume was 1710.98cc. The average homogeneity index was 0.02 and conformity index was 0.96. **Conclusion**: OARs doses with the use of VMAT with continuous sand partial arcs are within limit and PTV coverage was also satisfactory. The contralateral lung doses were also within limit. For more precise treatment and low doses of heart and contra lateral lung VMAT technique can be preferred for carcinoma left breast treatment.

DEFINITIVE CHEMORADIATION IN NON METASTATIC SQUAMOUS CELL CARCINOMA ANAL CANAL: A SINGLE INSTITUTION EXPERIENCE.

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Abstract

Background: To analyze the oncological outcomes in anal canal squamous cell carcinoma treated with concurrent chemoradiotherapy. **Materials and Methods:** A single centre retrospective hospital based study with sample size of 51 patients of anal canal Squamous cell carcinoma treated with concurrent chemoradiotherapy with mitomycin @10mg/m2and 5FU based. Disease free survival (DFS), Colostomy free survival (CFS) and Overall survival (OS) rates were calculated by Kaplan-Meier method. **Results:** Among 51 eligible patients, after a median follow up of 46 months (range 10-68months). The 3 year Disease free survival (DFS) was 73.9%. 3 patients developed locoregional recurrence while 1patient developed distant metastasis. At 3 years Overall survival (OS) rate was 77%. Out of 44 patients 6 patients lost to follow up while 2 patients died due to progressive disease and 2 due to non cancer causes. 3year Colostomy free survival (CFS) rate was 59%. Total 18 out of 44 patients underwent colostomy. No grade 3 or 4 late toxicities occurred after completion of treatment. **Conclusion:** This study concluded that definitive chemoradiotherapy achieves good local control, overall survival and colostomy free survival with acceptable toxicity and can be recommended as standard treatment in patients with carcinoma anal canal.

Keywords: Squamous cell carcinoma, Chemoradiotherapy, Three-Dimensional Conformal Radiotherapy (3D-CRT)

DIVERSE TREGS POPULATION AND EFFECTS OF THEIR INHIBITION ON GROWTH OF ORAL CANCER CELLS

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Oral squamous cell carcinoma (OSCC) is one of the major cancers affecting in Asian countries. The main causative factor has been tobacco habit. It has been reported that immune dysfunction in these patients is one of the major factors for tumor growth and dissemination that affects disease free survival of the patients. We assessed the phenotypic and functional characteristics of Regulatory T (Treg) CD4+CD25+FoxP3+subsets in patients with OSCC by multicoloured flow cytometry. Subsequently we investigated the effects their inhibition via TDG on growth of OSCC cell lines *in vitro*. An increased (p Hence, it seems reasonable to assume that modulation of functional dynamics of selective Treg subsets may be useful in enhancing anti tumor immunity and developing immunotherapeutic strategies for patients with oral squamous cell carcinoma.

ASSOCIATION OF CC CHEMOKINES WITH BREAST CANCER DISPARITY

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Despite recent advances, breast cancer (BrCa) still affects many women, and the impact is disproportional in African Americans (AA) compared to European Americans (EA). Addressing socioeconomic and behavioral status has not been enough to reduce disparity, suggesting racial difference BrCa biology in observed disparity. Our laboratory was the first to show the involvement of CC chemokines in BrCa. In this study, using ONCOMINE, TCGA, bc-GenExMiner, and KMplotter, we examined the association of CC chemokines in BrCa outcomes and disparity. We show over-expression of CCL5, -7, -11, -17, -20, -22 and -25 in BrCa tissues. High mRNA levels of CCL7, -8, -17, -20, and -25 predicted a decrease in overall survival (OS). CCL7 and CCL8 were associated with decreased relapse-free survival. Expression of CCL17 and CCL25 was associated with decreased OS in AA. In EA, CCL8 was associated with decreased OS. Expression of CCL5, -7, -8, -17, -20 and -25 was highest in TNBC. Expression of CCL11 and CCL22 was associated with HER2. CCL7, -8, -17, -20 and -25 were elevated in AAs. In conclusion, our analysis suggests the significant association of CC-chemokines in BrCa progression, OS, and disparate disease outcome in AA compared to EA patients.

MICROBIOME DYSBIOSIS IN CERVICAL CANCER HEALTH DISPARITIES

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Background: Cervical cancer(CC)is a high-risk human papilloma virus (hrHPV) associated malignancy and one of the leading causes of cancer-related death in women in the USA and worldwide. Surveillance through hrHPV and pap smear-based testing has remarkably reduced CC incidence. However, considerable racial disparities in the incidence and clinical outcome of CC exists. Recent studies suggest that imbalance in cervical microbiome may play a crucial role in CC risk and outcome. **Methods:** Cervical intraepithelial neoplasia (CIN)lesions were collected from African-American (AA), Caucasian-American (CA)and Hispanic/Latina (HIS)women (n=12 from each group, total =36). Bacterial genomic DNA was extracted from the above bio-specimens and the 16S rDNA V4 region was amplified Illumina 16Sv4 v1.2)by PCR and

sequenced on the MiSeq platform (Illumina MiSeq v2 2x250 v1.8). **Results:** A total of 232,095 reads and 259 unique operational taxonomic units (OTUs) were observed. OTUs were across 13 different phyla, 74 families, and 142 genera. The top phyla identified included *Actinobacteria, Proteobacteria, Firmicutes, and Bacteroidetes*. Three major genera identified were *Lactobacillus, Leucobacter, and Corynebacterium*. Among the genera that showed different read abundances across groups were *Gardnerella, Micrococcus, and Prevotella*. Lower abundance of *Lactobacillus*, a beneficial microbe of the female reproductive system was evident in both AA and HIS compared to CA women. On the other hand, a higher abundance of pathogenic *Leucobacter* and *Prevotella* was evident in the AA/HIS compared to CA women. **Conclusions:** Presence of distinct microbial niche in precancerous cervical lesions from different racial groups may be associated with varying risk of developing CC and subsequent progression that should be explored in future investigations.

DESIGN AND OPTIMIZATION OF BIOMIMETIC SUPRAMOLECULAR NANOCONSTRUCT FOR EFFECTIVE TARGETING AND THERAPY FOR TRIPLE NEGATIVE BREAST CANCER

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Abstract

Background: Breast cancer is the second most diagnosed cancer among American women. Although there are some significant improvements in survival, therapies have been met for some subtypes of breast cancer, yet not much improvement is achieved for triple negative breast cancer. Thus, conventional therapies as chemotherapy by systemic route are the most used treatment regimens by clinicians. Although, these therapies effective in subsiding cancer at the time being yet causes significant adverse aftereffects and/or relapse of the cancer because of the administration of the cytotoxic chemotherapeutic agents. **Materials & methods:** Supramolecular nanoconstructs were designed by PVP and TA loaded with paclitaxel and coated with LPS activated bio-inspired artificial cell membranes or naturally derived cell membranes. Using homogenization and differential centrifugation techniques the membrane coated nanoparticles were generated. They were optimized and evaluated for optimum size, shape and with necessary functional moieties for effective targeting ability to the tumor cells. In vitro and vivo characterization was conducted to confirm the effectiveness of these nanoconstruct. Additionally, safety evaluation was conducted by processing the histopathology, blood chemistry analysis and hemotoxicity images. **Results:** Overall we have tested five bioinspired cell membranes. Among these we conclude that the neutrophil coated nanoparticles possess the best targeting ability by prolonging circulation for at least 24-48hrsin comparison to non-membrane coated nanoparticles that were cleared within 6-8hrs. The safety evaluation was the most significant finding in this study, which suggests the membrane coated nanoparticles improved the respective serum enzyme and blood count levels in comparison to the other treatment groups. Thus, concluding that these nanoparticles were comparatively safer therapeutic option for preventing common adverse effects such as leukopenia and neutropenia and severe peripheral neurotoxicity seen in 30-40% of patients receiving chemotherapy by paclitaxel. **Conclusion:** This study represents a safer therapeutic potential of cell membrane-based nanoparticle constructs that not only provides enhanced targeting to the tumor regions and metastatic microenvironment due to self-marker recognition on their surface. But also, the safety profile generated from this finding is a significant contribution to the patient community administrating paclitaxel as their primary treatment modality, as the side effects caused for the systemic administration of paclitaxel and similar chemotherapeutics cause some serious adverse effects that affects their quality of their life. All of which could be mitigated with developing similar therapeutic options as membrane-based nanoparticles.

IMPACT OF SOME FACTORS ON THE SURVIVAL RATE OF BREAST CANCER PATIENTS IN THE STATE OF TEXAS

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Background: Center of Disease Control (CDC) reports, breast cancer (BrCa) to be the most common cancer among women in the United States across all races and/or ethnicity groups, after skin cancer. In this study, we investigate the main factors such as, insurance, treatment, poverty, gender, age, stage, and grade of the cancer that affect survival rates of BrCa patients in the State of Texas with respect to race group. **Methods:** Texas Cancer Registry (TCR), Cancer Epidemiology and Surveillance Branch and Texas Department of State Health Services, Austin, TX, data has been used. The survival time of breast cancer patients is studied from diagnosis time to a specified time (1995 to 2015). Statistical tests, log-rank, Kaplan-Meier survival function estimation, and Cox proportional hazards regressions are used to assess survival rates. **Results:** Our results indicate that a racial disparity is evident in the survival of BrCa patients in Texas. Compared to the Whites, Blacks have the shortest length of survival with a hazard ratio of 1.33 (p-value<.0001). The Kaplan-Meier survival function estimation also shows that Black's survival function is at the bottom followed by Hispanic's with a log-rank test p-value of <.0001. Age is also a significant factor in the survival of BrCa patients, since older patients, over 65, demonstrate a lower survival rate compared to less than 40-year-old with a hazard ratio of 1.208 and a p-value <.0001. Compared to un-Stage patients, patients with stage 1 have a much longer survival time with a hazard ratio of 0.296 and a p-value of <0.001 while patients with stage 4 have a hazard ratio of 4.155 with a p-value of <0.001. The Patients having the lowest income demonstrated the least survival time, with a lower survival curve (log-rank p-value<.0001), compared to other levels of income. Also, our study shows that the type of treatment matters. **Conclusions:** This paper provides a succinct overview of the breast cancer disease and factors associated to the survival time of the patients in the state of Texas. Race disparity on breast cancer survival time is quite noticeable and so is the stage factor of the cancer disease.

CROSS-LINKED NANOCOMPLEXES FOR DRUG DELIVERY APPLICATIONS

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Background: Nanotechnology often overcomes the chemotherapy associated issues. Nanotechnology- based carriers primarily aimed to improve the therapeutic efficacy of anticancer agents by increasing bioavailability, solubility, and retention time at the tumor sites. On the other hand, nanoparticle technology offers the improved tumor targeting capability of therapeutic drug(s), which in turn reduces the systemic side effects. Such events reduce dosing frequency in a chemotherapy regimen. Among various types of nanocarriers, naturally occurring compound based nanocomplexes have been receiving extensive attention in drug delivery applications. Therefore, the goal of this study was to investigate the potential utility of modified pectin and tannic acid cross-linked nanocomplexes (MPT-NCs) for cancer therapeutic application. **Methods:** We developed and used an innovative approach of highly stable nanocomplexes based on modified pectin and tannic acid (MPT-NCs). The nanoassemblies formation was enabled by strong intermolecular interactions between pectin and tannic acid under very mild conditions. These nanoassemblies were characterized by particle size and morphology (DLS, TEM, and SEM), FT-IR spectroscopy, and zeta potential measurements. Its delivery capacity has been determined for anticancer drugs using pancreatic cancer cell-line models. **Results:** Spherical formation of nanoself-assemblies were determined by DLS, SEM, and TEM analysis. The composition is identified by FT-IR spectra. Cellular uptake studies demonstrated a time and dose dependent internalization for improved therapeutic benefit. Cell viability and clonogenic formation assays clearly validated the superior anticancer effects against pancreatic cancer cells. **Conclusions:** Altogether, this study findings suggest that nanocomplexes based strategy can be an efficient drug delivery approaches.

MUC13 ENHANCES ANCHORAGE INDEPENDENT SURVIVAL AND COOPERATES WITH YAP1 TOWARDS COLORECTAL CANCER METASTASIS

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About 90% of all cancer related deaths are due to the development of metastatic sites in the body. With 40-50% of all Colorectal cancer patients developing metastasis at some point during the disease, understanding the underlying mechanisms is vital. Death due to attachment from the Extracellular matrix is a natural defense against metastasis is called Anoikis. Understanding the mechanism overcoming Anoikis is an important step towards developing new therapeutic options to prevent the metastatic spread of cancer cells. We identified mucin MUC13 in correspondence with YAP1 and β-catenin as key upregulated proteins in anchorage independent survival and metastasis progression. MUC13 expression correlated with an increase in survival among SW480 cells and decrease in survival in SW620 cells when expression is loss. We found that MUC13 expression led to an increase in the formation of YAP1/β-catenin survival complex within the nucleus at 36hrs. Further we found enhanced interaction between MUC13/YAP1 and MUC13/β-catenin in the nucleus was also observed. In human CRC tissues, MUC13 and YAP1 expression was high in tumor compared to normal adjacent tumor along decrease survival among high MUC13 and YAP1 expressing tissues. When MUC13 was found in the nucleus we found a positive correlation with the total YAP1 expression. This supports the notion that MUC13 is a key factor in enhancing anchorage independence survival and CRC tumorigenesis through cooperation with YAP1 and β-catenin. This study for the first time demonstrates complex formation between MUC13, YAP1 and β-catenin, and define their role in CRC progression and metastasis.

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In an isogeneic CRC cell line model, overexpression of MUC13 in non-metastatic SW480 cells (originally expressing minimal MUC13) increased anchorage independent survival and enhanced tumorigenesis compared to SW480+Vector cells. Metastatic SW620 CRC cells (highly expressing MUC13) showed a decreased anchorage independent survival and tumorigenesis after knockdown using specific shRNA targeted against MUC13, compared to its vector.

PRODUCTION OF CODON OPTIMIZED POLYOMAVIRUS SMALL T ANTIGEN IN ESCHERICHIA COLI.

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Abstract

Background: Hauzen et al., postulated that oncogenic human papillomavirus (HPV) is the etiological agent of cervical cancer (2008). Eleven new human polyomaviruses (HPyVs) have been identified and shown to infect humans sub-clinically since early age. The small t antigen (tAg) proteins of polyomaviruses alter intracellular phosphorylation cascades controlling cellular replication. The specific mechanisms of transformation and progression to tumor cells, and cellular tropism of the new HPyVs, are not completely understood. Availability of recombinant tAg (rtAg) can contribute to comprehend them. **Methods:** tAg coding sequences derived from Merkel cell polyomavirus (MCPyV) genome were codon-optimized, synthesized, cloned in an expression vector (pGEX), and transformed into E. coli. Clones were fermented, induced for expression of the tAg cassette, and purified by Immobilized metal affinity chromatography (IMAC). **Results:** rtAg produced in bacteria from different expression strains demonstrated distinct expression levels. The rtAg of ~20KDa

was produced at an average level of 11.3 mg L-1 and folded correctly since anti-MCPyV antibody 5 recognized the rtAg. **Conclusions:** MCPyV tAg expressed in E. coli could be an useful tool in immunity diagnostics, structural biology studies, investigations of metabolic pathways interference and cell tropism features of HPyVs infections. This specially until cell culture systems for new HPyVs are developed.

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Biomedical Engineering, Technology, Computation

ENGINEERED EXOSOMES FOR THE MULTIMODAL IMAGING DIRECTED PHOTO-IMMUNOTHERAPY OF COLORECTAL CANCER

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Background: Rio Grande Valley experience severe cancer health disparity. A novel therapeutic modality may serve as better therapeutic option. Nanohybrids endowed with multifunctionality, longer circulation time, large surface area have emerged as an active preference for cancer research. However, rising concern of nanomaterials toxicity and scalability issues has slowed their translation to clinics. Exosomes (Exo) are endogenous endocytic origin 40-100 nm vesicles found in various body fluids, which in comparison to synthetic nanoparticles, are biodegradable, highly biocompatible as well as immunocompatible in nature. Although bulk isolation of exosomes from human body fluids is still a problem and engineering of exosomes to harness its potential is still in infancy. **Methods:** The Exo were isolated from dairy milk using EDTA precipitation method, and superparamagnetic iron oxide nanoparticles(MNPs)were synthesized by ammonium hydroxide co-precipitation method. The Exo were sonicated(60sec) with MNPs and near-infrared (NIR) light-absorbing dye indocyanine green (ICG) and then incubated overnight at 37^{o}C. The characterization of ICG@Exo-MNPs was done using several techniques. The targeting nature of ICG@Exo-MNPs was determined on colorectal cancer cells SW480 and SW680. The phototransduction and in-vitro photothermal therapy were performed using1W,808nm NIR laser. **Results:** The ICG@Exo-MNPs nanohybrid found to have size around 100 nm with good dispersity. The coating of exosomes and magnetic field actuation increased the targeting efficacy of ICG@Exo-MNPs in colorectal cancer cellsby10% in SW40 and30% in SW680.ICG@Exo-MNPskilled the SW480 cells to more than 80% within 2min. of NIR light irradiation. **Conclusions:** This study shows enhanced photothermal therapeutic behavior of ICG@Exo-MNPs for near-infrared fluorescence imaging directing killing of colorectal cancer cells.

PRECISE METHOD TO IDENTIFY KINASE DRUG TARGETS IN COMPLEX DISEASES: THE FIRST STEP TOWARDS SUSTAINABLE AND EFFECTIVE TREATMENT

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Background: Kinases are enzymes that have proven to be important drug targets due to their role in critical biological mechanisms such as phosphorylation. Phosphorylation happens when a kinase catalyzes the transfer of a phosphate group to a protein in a phosphorylated site, which then becomes known as the substrate of the kinase. Any dysregulation of protein phosphorylation causes a wide range of complex diseases including cancer. Thus, discovering the links between kinases and their substrates (i.e. predicting kinase substrate associations (KSAs)) is crucial in developing effective and sustainable treatments. Presently, less than 5% of phosphorylated sites have an associated kinase, and existing prediction methods tend to favor well -known kinases. In this project, we use algorithms (NetREX) that were developed in the context of gene regulatory networks to create a network of kinases and substrates to improve prediction precision by uncovering

hidden KSAs, while also comprehensively analyzing existing computational methods. **Methods:** We modify NetRex, a method developed to find the links between transcription factors and genes, to create a network, where kinases and their phosphorylated sites are nodes and the known associations between them (KSAs) are represented by edges. We use the network component analysis model (NCA), which assumes that each kinase is characterized by its activity. NCA explains the phosphorylation of each phosphosite as a linear combination of the activities of its regulating kinases. We iteratively add and remove edges in the network, where co-phosphorylated sites are co-regulated, and kinases with correlated activities coregulate the same site. Lastly, our edges are ranked by their confidence score, which is their impact on the overall performance of the linear model. **Results:** Once we ran the algorithms on our data, we were able to obtain a network of kinases and substrates. We are currently in the process of performing cross validation to assess sensitivity and specificity of our network using methods such as 5-fold and leave-one out. In addition, we will comprehensively analyze and compare our results with other computational methods to see if an improvement was achieved. **Conclusions:** Identifying kinases causing abnormal phosphorylation is essential for drug discovery and effective treatment. Current computational prediction methods tend to find KSAs for kinases that already have several phosphorylated sites associated with them. Based on our results, we anticipate to uncover KSAs for kinases that do not have many phosphorylated sites associated with them priorly.

A 3D PRINTED MICRONEEDLE SYSTEM FOR TRANSDERMAL DRUG DELIVERY OF ANTICANCER DRUGS

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Background: Transdermal delivery of drugs is an attractive alternative to the conventional route of administration as oral delivery. The hypodermic injections are painful and less patient compliance. Microneedles (MNs) are micron-sized, minimally invasive needles to deliver a wide range of molecules (e.g., small, DNA, vaccines etc.) to the upper portion of dermis in a sustained and controlled manner, without causing any pain. The introduction of 3D printing technologies in the fabrication of MN will promote one step manufacturing tools and scale up for the delivery devices of anticancer drugs. **Methods:** The 3D printed MN (3DMN) arrays were fabricated using Stereolithography (SLA), a photopolymerization-based technology, using a biocompatible Class I resin. The printed MN arrays were characterized using Scanning Electron Microscopy (SEM) and coating was evaluated through Fluorescence Microscopy (FM). The penetration efficiency of 3DMN was investigated through the Optical Coherence Tomography (OCT) into the skin in vitro. The delivery efficiencies of MN arrays to release anticancer drugs in vitro were investigated using Franz diffusion cells and vivo animal studies were carried out to determine the delivery of anticancer drugs and tumour regression effect in mice. **Results:** 3DMN arrays were successfully fabricated using SLA technology and the dimensions were reproducible. OCT studies have shown more than 80% penetration capability. In vitro and in vivo studies demonstrated the rapid transdermal delivery of anticancer drugs and regression of tumour in mice. **Conclusions:** These 3DMNs may prove to be of great assistance for the delivery of anticancer drugs in near future in painess, precise and accurate manner.
Keywords: Anticancer Drugs, Transdermal Drug Delivery, Microneedle, 3D Printing

POSTER PRESENTATION ABSTRACTS

Undergraduate Student Category

CUCURBITACIN D AMELIORATES BENZO[A]PYRENE INDUCED LIVER INJURY VIA ACTIVATION OF NRF2 ANTIOXIDANT PATHWAY

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Abstract

Background: Co-morbidity variables, such as smoking, are strongly linked to the development and progression of liver cancer. Further, benzo[a]pyrene, a major component of tobacco smoke, is highly carcinogenic and triggers liver damage. Cucurbitacin, a kind of triterpene, has a wide range of biological properties, including antioxidant, anti-inflammatory, and anti-cancer effects. However, the precise mechanism of its hepatoprotective effects is obscure. **Objective:** The aim of this study is to investigate the cytoprotective effects of novel analog of cucurbitacin, cucurbitacin D, against benzo[a]pyrene-induced liver injury in HepG2 cells. **Method:** The cytoprotective efficacy of cucurbitacin D against benzo[a]pyrene-induced liver damage was studied using proliferation, clonogenicity, migration, invasion, Western blotting, and qPCR analysis. The levels of intracellular reactive oxygen species (ROS) in liver cells was measured using the DCFDA assay. **Results:** In human HepG2 cells, functional experiments revealed that cucurbitacin D has cytoprotective effects against dose-dependent growth inhibition by benzo[a]pyrene. The mitigation of ROS observed by fluorimeter and fluorescence microscopy suggested that this protective effect was likely due to cucurbitacin D's antioxidant property. Additional research is ongoing to identify the effect of cucurbitacin D on oxidative stress markers by using qPCR and western blotting techniques. Overall, these findings showed that cucurbitacin D diminishes benzo[a]pyrene-induced liver injury via its antioxidant activity. **Conclusion:** These findings show that cucurbitacin D has hepatoprotective properties against benzo[a]pyrene-induced liver injury, making it an attractive food supplement ingredient.

A NATURAL NEAR-INFRARED FLUORESCENT PROBE FOR CANCER CELL IMAGING

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Background: Rio Grande Valley (RGV) suffers from a high prevalence of certain cancers and lack the resources for accurate early diagnosis. Near-infrared (NIR) fluorescence-based imaging is a noteworthy and safer strategy for cancer detection compared to radiological imaging. There are several NIR dyes including indocyanine green (ICG) and its analogues that allow high-resolution and deep tissue imaging. However, these dyes possess some drawbacks, namely photo instability, toxicity, poor water solubility, and short half-lives. Chlorophyll (Chl) is a natural dietary and biocompatible NIR fluorescent substance which has the potential to serve as a cancer NIR imaging candidate. Hence, we aim to extract Chl from dietary leaves for cancer cell imaging. **Methods:** 12 different dietary leaves were imaged using the IVIS imaging system at 600/710 nm to assess the fluorescence distribution of chlorophyll. Next, Chl dye was extracted using ethanol from the 6 most fluorescent leaves and visualized for fluorescence. Size distribution, surface charge, and the concentration of these extracts were measured by a DLS system. Chl internalization in AsPC-1 (pancreatic) and SK-HEP-1 (liver)cancer cell lines

was determined by EVOS imaging system after treated with highest fluorescent extract at different concentrations. **Results:** IVIS imaging data revealed that Chl was most fluorescent in bay leaf extract (4.98x1010MFI). Physicochemical characterization of bay leaf extracted Chl indicated the particle size of62.7 nm, zeta potential of -24.76mV, and concentration at1.11x1012particles/mL. Cellular internalization data showed a dose dependent increase in bay leaf extracted Chl fluorescence in both cancer cell lines. Conclusions: This data suggests that dietary Chl is a potent biocompatible alternative for cancer cells NIR fluorescent imaging.

DEVELOPMENT AND EVALUATION OF A NANOFIBER MEMBRANE IN VITRO AS A THERAPEUTIC ALTERNATIVE FOR THE POST TREATMENT IN BREAST CANCER CELL IN A MURINE MODEL

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Worldwide female breast cancer is the most commonly diagnosed cancer, with an estimated 2.3 million new cases in 2020, reason for the need of targeted therapies that can maximize treatment success and minimize toxicity. Nanoparticles of gold (AuNps) exhibit cytotoxic properties against certain types of cancer cell lines. Nanofibers have been use in the drug delivery systems due to its degradability and high surface area. We proposed a membrane with nanometric fibers using polivinilic alcohol (PVA) and chitosan (Qts) loaded with AuNps and Doxorubicin (Doxo) with the purpose of diminish tumor regression. PVA-Qts membrane was develop with electrospinning, the injection, voltage, distance and relative humidity parameters were standardized and it were characterized by Microscopic Atomic Force. The cytotoxicity with a median lethal dose (DL50) in two cell lines, breast adenocarcinoma murine (4T1) and murine fibroblast (NiH3T3)as a healthy control were evaluated. AuNps had a size of 3 nanometers (nm) with a Z potential of 13.2 mVolts and a DL50 of 75 µM in the cell line 4T1.Doxo was decrease in 95% with a final concentration of 0.03 mg/cm2.Both doses were loaded in the PVA-Qts solution. PVA-Qts-Doxo and PVA-Qts-AuNps-Doxo decrease the viability in 4T1 in 24hourswith a 15%,72hourswith a 28%, the first with 60% and the latter with 82%. PVA-Qts-Doxo and PVA-Qts-AuNps-Doxo in NiH3T3 diminish incrementing with the time reaching a 40% in 120 hours. Finally, The viability for 4T1cultured on PVA-Qts-Doxo was minor than in NiH3T3. The amount of Doxo in the membrane synthetized was 95% less than the employ doses, demonstrating that the fiber improves the delivery of the chemotherapeutic in a palatine time.

THE DUAL DELIVERY OF Y15 AND METFORMIN IN A PLGA SCAFFOLD FOR THE TREATMENT OF PLATINUM RESISTANT OVARIAN CANCER

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Background: Ovarian cancer is the fifth leading cause of cancer mortality among women in the US. High mortality is linked to resistance to platinum compounds. Currently there is no treatment for platinum resistant ovarian cancer (OCpt). Platinum resistance shows increased activity of focal adhesion kinase (FAK). Y15 is a FAK inhibitor and increases OCpt sensitivity to chemotherapy. Metformin induces apoptosis, has no increased cytotoxicity, and works synergistically with Y15 in OCpt cells. Biomaterial scaffolds deliver drugs locally, maximizing drug concentration and bioavailability while minimizing systemic toxicity. PLGA copolymer has excellent biocompatibility, versatility, and a tailorable degradation rate. The objective of this study is to utilize biomaterials as a dual drug delivery system and investigate if the combined delivery of Y15 and Metformin would result in synergistic effects on cell viability. **Methods**: A mold-less technique combining PLGA and the drugs in tetraglycol wereinjected intoPBS to form a globular scaffold. An MTT assay was used to analyze cell viability in OCptOVCAR3 cells at an absorbance of 570 nm with a microplate reader. **Results:** Metformin and Y15 resulted

in cell viabilities of 66% and 54%, respectively. When combined, the viability decreased to 23%. In studies with the fabricated PLGA scaffolds, cell viabilities were 74% and 89% for Metformin and Y15. When combined, cell viability decreased significantly to 5%. **Conclusions:** The delivery of Y15 and Metformin in a biomaterial scaffold can result in a synergistic effect on cell viability and thus, can be a promising approach for the treatment of OCpt.

THE APPLICATION OF ELECTROSPRAYED MINOCYCLINE-LOADED PLGA FOR THE TREATMENT OF GLIOBLASTOMA

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Key words: minocycline, biomaterials, glioblastoma, cancer, anti-angiogenesis, PLGA

Background: Glioblastoma multiforme (GBM) is one of the most common and aggressive forms of cancer with unfavorable prognosis due to high levels of reoccurrence with around 10,000 patients in the U.S. diagnosed each year. Despite treatment with surgery, radiotherapy, and chemotherapy, survival rate for this disease is around 21 months after diagnosis. Minocycline, a tetracycline-derivative used as an antibiotic, has also demonstrated the ability to inhibit angiogenesis or tumor growth and, presents a possible treatment option for GBM. **Methods:** Microparticles were fabricated by electrospraying by varying solvent type, distance, flow rate, voltage, and polymer concentration as parameters. The cytotoxicity of endothelial and glioblastoma cells was determined by an MTT assay by determining the absorbance using a spectrophotometer at a wavelength of 350nm. Scanning electron microscopy (SEM) imaging was used to image the samples to determine microparticle surface morphology and size via an electron beam due to microparticles being sputter coated with gold to generate an electrical conduction. **Results:** The electrospraying process consists of numerous parameters which directly affect the creation of microparticles. The use of the solvent methanol aids in dissolving minocycline, while the use of DCM is important for the process of electrospraying, due to its higher vapor pressure and ability to dissolve PLGA. **Conclusion:** In conclusion, electrospraying is a promising method to fabricate drug loaded PLGA microparticles. However, optimization is needed whenever there is a new drug of interest as it can modify the properties of the electrospray solution and result in different effects on the fabrication parameters and particles produced.

RACIAL DIFFERENCES IN THE EFFECT OF APOE-E4 GENOTYPES ON TRAIL MAKING TEST PART B IN ALZHEIMER'S DISEASE

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Abstract
The trail making test part B (TMT-B) is used to evaluate executive functions in order to better understand the progression of Alzheimer's disease (AD). The objective of this study is to better understand the association of apolipoprotein E epsilon 4 (APOE-ε4) genotypes on the TMT-B scores in those with Alzheimer's disease, specifically in the Hispanic population. This study used data from the Alzheimer's Disease Neuroimaging Initiative (ADNI). In total there were 482 participants with AD, 503 with cognitive normal (CN), 1,293 with MCI at baseline and a follow-up after four years. In this study the longitudinal effect of apolipoprotein E epsilon 4 (APOE-ε4) genotypes on the TMT-B scores in those with Alzheimer's disease was found. The results of this study found that individuals with 1 or 2 APOE-ε4alleles had significantly higher TMT-B scores, which correlates to poor cognitive function, compared to individuals without APOE-ε4allele at baseline and four follow-up visits using the multivariable linear mixed model. In addition, African American and Hispanic populations had higher TMT-B scores compared to whites. In conclusion our study found that there is a correlation between APOE-ε4 and TMT-B scores as well as an association between race and TMT-B scores.
Keywords: Alzheimer's disease; TMT-B; APOE-ε4 allele; Mixed model; Racial differences

YB-1 TRANSCRIPTION FACTOR PROMOTES SORAFENIB RESISTANCE IN LIVER CANCER

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Background: Hepatocellular carcinoma (HCC) is a primary malignant liver tumor that commonly occurs as a progression of chronic liver inflammation. Sorafenib is the standard first-line systemic drug for advanced HCC, but the acquired resistance to sorafenib results in limited benefits. The mechanism underlying sorafenib resistance in HCC remains unclear. Recently, we have identified a multifunctional oncoproteinY- box binding protein-1(YB-1) that dysregulates a wide range of genes involved in drug resistance in other cancers and is responsible for increasing theIC-50 of sorafenib in HCC cell lines. In this study we will analyze the signaling pathways and genes regulated by YB-1, that is responsible for increasing sorafenib resistant in liver cancer cells. **Methods:** HCC cell lines SK-Hep-1, C3A, HepG2 and Hep-3B were treated with Sorafenib andtheIC-50 was calculated using MTT assay. RNA and protein of YB-1 was analyzed using RT-PCR and western blot respectively. Lentiviral based overexpression and knockdown of YB1 was performed in these cell lines and sorafenib IC50 were calculated to verify its role in Sorafenib resistance. Development of sorafenib resistant cell line is in progress. **Results:** IC-50 values calculated from MTT assays of the HCCcell lines were compared with the YB-1 protein expression in four liver cancer cell lines. Knockdown of YB-1 re-sensitized cell lines to Sorafenib. We have developed Sorafenib resistant cell lines to further study the mechanism of YB-1 mediated drug resistance. **Conclusion:** This study will establish oncogenic YB-1 protein as an effective therapeutic target to overcome sorafenib resistance in liver cancer.

MICRORNA-145 REPLACEMENT AS A THERAPEUTIC TOOL TO IMPROVE TRAIL THERAPY

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Background: Pancreatic cancer (PanCa) is a third leading cause of cancer related deaths in US. Unlike other cancers, PanCa is highly resistant to TNF-related apoptosis-inducing ligand (TRAIL) that emerges as one of the most-promising therapy in clinical trials. Our group has previouslyidentifiedmicroRNA-145 (miR-145) is downregulated in PanCa, the restoration of which inhibits tumor growth and enhances gemcitabine sensitivity. In this study, we have observed that miR-145 restoration in PanCa cells renders them sensitive to TRAIL treatment. Therefore, we have engineered unique superparamagnetic nanoparticles (SPs) for co-delivering miR-145 and TRAIL in PanCa for improving their therapeutic response to TRAIL. **Methods:** We developed a co-delivery formulation ofmiRNA-145and TRAIL using our patented magnetic nanoparticle formulation (miR-145-MNPF) and assessed its potential to inhibit PanCa. Physico-chemical characterization (dynamic light scattering (DLS), transmission electron microscopy (TEM) and miR-binding efficiency), cellular internalization (Prussian blue and confocal microscopy), miR-145 restitution potential (quantitative reverse-transcription PCR (qRT-PCR), and anti-cancer efficacy (proliferation, colony formation, cell migration, cell invasion assays) of this formulation were performed using clinically relevant pancreatic cancer cell lines (HPAF-II, AsPC-1).We used pancreatic orthotopic mice to investigate the efficacy of this co-formulation in mice. **Results:** The results in this study demonstrate that acquired resistance to TRAIL in PanCa cells can overcome with the replacement of lost levels of

miR-145 expression. Our SP nanoparticles were engineered to co-deliver miR-145 and TRAIL to PanCa cells, which resulted in simultaneous restoration of miR-145 and inhibition of acquired resistance to TRAIL. Combined actions of miR-145 and TRAIL markedly improve TRAIL-induced apoptotic effects in PanCa cells through the activation of an extrinsic apoptosis pathway pathway as indicated by activation of DR5, FLIP, FADD and enhanced expression of caspase-8/3.The co-delivery of miR-145 and TRAIL using SP nanoparticles inhibited tumorigenic characteristics of PanCa cells, which include proliferation, invasion, migration and clonogenicity .The results were reciprocated and got further confirmed with the inhibition of tumorsphere formation and in vivo tumorigencity in xenograft mice. Immunohistochemical staining of excised tumor tissues demonstrate an activation of death receptor pathway and subsequent expression of apoptotic markers. **Conclusion:** The study provides novel insights on two facades-how resistance of cancer cells to TRAIL-based pro-apoptotic therapies can be tackled, and how efficient intracellular delivery of TRAIL can be achieved. Our results suggest that acquired resistance to TRAIL can be overcome by co-delivery of miR-145 and pEGFP-TRAIL using SP nanoparticles.
Keywords: Trail, Micro RNA, Pancreatic Cancer, Orthotopic

SPINAL CORD INJURY: WHAT ABOUT THE BRAIN?

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Background: Recent research has suggested that the brain may also undergo neurodegeneration after aspinal cord injury (SCI). Here, we evaluated neurodegeneration in the brain of patients with SCI and related neurodegeneration to rehabilitation performance, spine degeneration, and motor function. **Methods:** T1-weighted and diffusion weighted images of 13SCI patients and 13 healthy controls were obtained. We evaluated fractional anisotropy in the motor cortex (MC), the sulci in front of the MC, the posterior limb of the internal capsule (PLIC), and the cerebral peduncles (CP) in both hemispheres to determine neurodegeneration. Statistical analysis was performed between patients with SCI and healthy controls. A p-value <0.05 was considered significant. **Results:** In the MC and PLIC, we observed significant neurodegeneration in the side of the brain controlling the weakest side of the body in SCI patients ($p<0.0001$, $p=0.04$ respectively). Interestingly, the MC and PLIC in the side of the brain controlling the strongest side of the body in SCI patients was similar to the healthy controls. The CP and the sulci in front of the MC in SCI patients were similar to the healthy controls. **Conclusions:** Our results suggest that SCI patients have neurodegeneration in the MC and PLIC in the side of the brain controlling the weakest side of the body. Future research will evaluate more regions of interest to help determine if white matter loss increases as it approaches the spinal cord. We are also evaluating how spinal cord neurodegeneration relates to our observed neurodegeneration in the brain.

NEURODEGENERATION DIFFERENCE BETWEEN THE NON-LESIONED AND LESIONED HEMISPHERE IN STROKE PATIENTS

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Background: Stroke is the 4th leading cause of death in Hispanics. It has generally been suggested that neurodegeneration is isolated to the lesioned hemisphere. However, recent evidence has suggested that the non-lesioned side of the brain may also undergo neurodegeneration. Here, we sought to evaluate the amount of neurodegeneration in the lesioned and non-lesioned hemisphere in chronic stroke patients and identify the impact of stroke size and location. **Methods:** T1-weighted magnetic resonance imaging and diffusion weighted imaging (DWI) of the brain was collected in 23 patients with chronic stroke and 14 healthy controls. We quantified the amount of neurodegeneration in the lesioned and non-lesioned hemisphere in the cerebral peduncles (CP), posterior limb of the internal capsule (PLIC), pons, and motor cortex. The size

and the white matter integrity in the region of interest were determined. The amount of neurodegeneration between groups was statistically compared, a $p<0.05$ was considered statistically significant. **Results:** We observed that CPs in the lesioned hemisphere were smaller compared to the non-lesioned hemisphere and healthy controls (304mm^3vs 488 mm^3vs 374 mm^3). In addition, patients with stroke had reduced white matter integrity in both the lesioned (255.99 ± 35.43) and non-lesioned (257.36 ± 39.21) hemispheres compared to controls (329.98 ± 23.45). **Conclusion:** Our results indicate that neurodegeneration occurred in both hemispheres of the brain after a stroke. However, the damage or amount of neurodegeneration was significantly higher in the lesioned hemisphere. Therefore, our work suggests that therapists should consider targeting both sides of the body rather than the more affected limb.

APOE POLYMORPHISM AND ITS ASSOCIATION WITH DEMENTIA, NEUROPSYCHIATRIC DISORDERS, AND DEMOGRAPHIC FACTORS IN U.S HISPANIC POPULATION

Victoria I. Padilla

In 2019, the United States Census revealed that Hispanics are the greatest minority group in the U.S, 18% of the population; in 2060, it is expected to increase by 28%. Hispanics ages 65 have one of the highest rates of Alzheimer's disease (AD) in the U.S. Studies have linked AD and other cognitive impairments, MCI, with apolipoprotein or APOE gene. APOE has also shown to increase the risk of neuropsychiatric disorders in individuals. However, there are limited studies in U.S Hispanics. This study examines the APOE gene and its associations with dementia-related phenotypes, neuropsychiatric disorders, and demographic factors in U.S Hispanics.

APOE gene and its association with dementia, neuropsychiatric disorders, and demographic factors in U.S Hispanic population.

A total of 1,382 Hispanic participants were collected using our own data (N=62) and data collected by Texas Alzheimer's Research and Care Consortium, TARCC (N=1,320). Questionnaires about medical history and demographics (e.g., age, education, and gender) were given. Saliva samples (N=62) and blood samples (N=1,320) were collected to obtain the APOE gene.

Our studies showed that there are associations between APOE-ε4 and AD in the Hispanic population. No associations were found between APOE-ε4 and MCI. Furthermore, carrying at least one copy of the APOE-ε4 increases the risk of developing anxiety and depression. It was observed that AD had higher frequencies of anxiety, depression, and motor disturbances.

This study demonstrated associations of the APOE e4 allele with AD in U.S. Hispanics. Also, the APOE e4 allele was associated with anxiety, depression, and motor. Further studies are needed to confirm our current findings due to the small sample size.

AUTOMATED VERSUS MANUAL RNA ISOLATION IN THE LABORATORY DIAGNOSIS OF SARS-COV-2.

Author: Nathalia Walle

Graduate Student Category

TRIMERIC INTERACTION OF ANTP-UBX WITH TBP AND HOMEOPROTEIN EXD IN THE GENETIC CONTROL OF DEVELOPMENT IN D. MELANOGASTER

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Homeoproteins specify body segments along the anteroposterior axis during embryo development; they bind DNA through the homeodomain (HD). Homeoproteins bind to similar and repetitive target sequences on DNA, raising the question of how they achieve functional specificity. Homeoproteins form complexes with proteins through the HDs or other regions. Antennapedia (Antp) and Ultrabithorax (Ubx) have an important role in conferring thorax identity; also they are involved in a repression transcriptional mechanism: Ubx binds to Antp promoter repressing its expression. We analyzed if Ubx and Antp perform protein-protein interaction as a regulation mechanism and if the complex Antp-Ubx are involved in trimeric interaction with other transcription factors. Using Bimolecular Fluorescence Complementation (BIFC) we showed Antp-Ubx interaction in cell culture and in vivo in embryos and imaginal discs of Drosophila melanogaster. Also, we detected the Antp HD importance as well as the E19G residue in the interaction. We next analyzed if dimer Antp-Ubx affected Antp function in head involution on larvae, showing 80% of larvae with homeosis. In adult flies dimer Antp-Ubx caused a partial antenna to leg transformation. Additionally, using BiFC-based FRET, we showed that Antp-Ubx form trimeric complexes with TBP and EXD in cell culture and we test the trimeric complexes function in vivoin head involution on larvae, showing80% of homeosis expressing Antp-Ubx/TBP complex and 66% of homeosis expressing Antp-Ubx/EXD complex. We conclude that Antp-Ubx is involved in trimeric interaction with TBP and EXD and both trimeric complexes are important for Antp function in vivo.

IN SILICO EVALUATION OF PHENOTHIAZINE DERIVATIVES AS TRYPANOTHIONE REDUCTASE INHIBITORS

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Background: American trypanosomiasis is caused by parasite *Trypanosoma cruzi*, and it is considered a worldwide health problem. Current treatment consists of benznidazole and nifurtimox, which are not fully effective against both disease stages and have adverse effects. There is thus a need to find parasite-specific alternative treatments. Search of specific inhibitors of parasite-exclusive crucial enzymes is a known strategy. Trypanothione reductase(TR)enzyme is central in parasite's redox system both for detoxification of reactive oxygen and nitrogen species as well as amino acid and nucleotide biosynthesis. Phenothiazine scaffold is known by pharmacologists as a very versatile structure and its derivatives have shown TR inhibition. A virtual screening of phenothiazine derivatives from PubChem database may permit finding potential TR inhibitors. **Methodology:** TR crystal was obtained from the PDB database (1GXF). A total of 100 phenothiazine derivatives complying with Lipinski's rules were docked in TR active site using AutoDock Vina 1.1.2. Binding energy and interaction profiles, determined with PLIP (Protein-Ligand Interaction Profiler) server, were used to discriminate among derivatives. **Results:** Binding energy was found to be in the range of -10.9 to -6.1 kcal/mol compared to -8.8 kcal/mol of natural ligand trypanothione disulfide (TS2). Forty-two compounds showed a binding energy greater than or equal to natural ligand, top ten were determined interactions. Main interactions were found with residues important toTS2binding: Phe396, Leu399, His461, Glu466 andGlu467. **Conclusion:** Best ranked compounds both by binding energy and interactions may be proposed as TR inhibitors and assayed in vitro to test effectivity.

NOVEL THERAPY TARGETING MUTANT-KRAS^{G12D} AND GALECTIN-1 IN PANCREATIC CANCER

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Introduction: Although, surgical resection and chemotherapy are the gold standard for treating Pancreatic Ductal Adenocarcinoma (PDAC), low patient survival rate remains the problem. The activating point mutation of the KRAS on codon-12 is present in 70–95% of PDAC cases and so far, no success has been achieved to inhibit KRAS. KRASG12D regulates cell proliferation, differentiation, apoptosis. Recent preliminary and published studies show high Galectin-1 (Gal-1) levels in both pancreatic cancer and stromal cells, which modulate tumor microenvironment and metastasis. Additionally, genetic deletion of gal1 inhibits metastasis and improves survival in KRAS mouse model of PDAC (1). Therefore, our objective is to develop a novel combination therapy for PDAC by targeting mutated KRASG12Dpoint mutation and Gal-1. This includes the delivery of KRASG12Dinhibiting siRNA (siKRASG12D) using a superparamagnetic iron oxide nanoparticle (SPION) and a galectin inhibitor. **Methods:** ASPC1/Panc-1 (human), KPC (mouse) cells were used. Our patented SPION nano-formulation (2) has been used to deliver siKRASG12D and investigated in conjunction with Gal-1 for its anticancer efficacy. Particles were investigated for size, physico-chemical characterization (Dynamic light scattering), hemocompatibility (hemolysis assay) and the complexation of siKRAS (gel retardation assay). Cellular internalization and uptake of the particles were investigated using FAM labelled siRNA and Prussian blue assay. KRASG12Dsilencing was confirmed at both mRNA and protein levels. Anti-cancer efficacy of the formulation was determined using in vitro functional assays for cell viability (MTT), migration (Boyden chambers), invasion (Matrigel), clonogenicity, tumor spheroid formation, and in nude mice. **Results:** Our results demonstrate optimal particle size and zeta potential of SP-siKRAS formulation. SP-siKRAS efficiently internalized in PDAC cells and suppressed KRASG12Das well as its downstream targets, YAP and PDL-1. Combined targeting of siKRAS and Gal-1 inhibited cell proliferation. The formulation inhibited chemoresistance, cell proliferation, clonogenicity, migration, and invasion of pancreatic cancer cells. This resulted in activation of death related mechanisms, such as Bax, bcl-2, PARP cleavage in KRASG12Dcells. Interestingly, the formulation was highly effective in inhibiting KRASG12Dand growth of tumor spheroid in 3D cell models, which recapitulate the heterogeneity and pathophysiology of PDAC. This further provides a clinical validation demonstrating potential of SP-siKRAS particles to efficiently silence KRAS expression. SP-siKRAS also exhibited hemocompatibility, suggesting its potential of silencing KRAS without being toxic to the body. Additionally, the formulation was efficiently delivered in nude mice to exhibit KRasG12Dsilencing and inhibit tumor growth. **Conclusion:** This gene therapy targeting KRAS G12D mutation with a Gal-1inhibitionhas a potential to modulate the oncogenic network and tumor microenvironment resulting in the repression of growth, metastasis, chemoresistance, and improvement in patient survival. This study will develop a novel sustainable therapeutic approach to target pancreatic cancer growth and improve patient survivability.

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DISPARITIES AND MICROBIOME AFFECTING LIVER DISEASE PROGRESSION

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Introduction: Non-alcoholic fatty liver disease (NAFLD) is a metabolic illness that encompasses a wide range of pathological states, from simple steatosis to steatohepatitis (NASH)to cirrhosis and hepatocellular carcinoma. NAFLD is the most prevalent liver disease in the world, accounting for 25% of all liver disease cases. A high-fat diet, smoking, and alcohol consumption have all been proven to disrupt the balance of beneficial and possibly pathogenic bacterial species, resulting in intestinal dysbiosis. The prevalence of liver cancer (LC) among Latinos in South Texas remains greater than elsewhere in the United States, necessitating further research on population-specific risk factors and aggressive mortality. Incidence rates among Hispanics are three to four times greater than among non-Hispanic whites. There are no precise molecular markers or imaging modalities that have the sensitivity or specificity to identify NAFLD patients at an early stage

of illness or at a high risk of developing NASH/Cirrhosis or HCC and consider them candidates for early surgical intervention. Therefore, there is a need for the creation of non-invasive, selective molecular markers for detecting precursor lesions with dysplasia that advance to HCC. The makeup of the human gut microbiota, which is made up of hundreds of microbial species, can change with chronic illnesses that underpin health inequities that disproportionately afflict ethnic minorities. **Methods:** In this study, we explored the incidence and mortality rates of liver cancer in different ethnicities, Hispanics, African Americans, and non-Hispanic whites (NHW). This has been analyzed based on current literature. **Results:** Hispanics have the highest microbial richness and evenness in both study groups, followed by Non-Hispanic whites and Asian Pacific Islanders. Obesity, diabetes, and lifestyle changes, among other factors, have contributed to an increase in the number of instances of NAFLD in Hispanics. An increase in the number of Enterobacteriaceae, Veillonellaceae, and Streptococcaceae, as well as a reduction in the abundance of Lachnospiraceais witnessed in cirrhosis patients. **Conclusion:** There are different microbial fingerprints and interspecies interactions in several liver disorders that are susceptible to develop in HCC across ethnicities. Future studies are warranted to investigate the role of microbiota in conversion of NAFLD patients, role of microbiota in mediating HCC.

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COMPARISON OF FIVE COMMERCIAL KITS FOR SARS COV 2 RT-PCR DIAGNOSIS.

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BACKGROUND: SARS-CoV-2 was identified as the causal agent of the COVID-19 pandemic. Its rapid spread and huge health and economic impact prompted the development of diagnostic tests to opportunely identify affected individuals as a prerequisite to quarantine them and avoid further spreading the infection. **Methods:** The following commercial RT-PCR kits, approved by our National Institute of Diagnostics and Epidemiological Reference of InDRE (from the Spanish name) were tested: Vircell (Granda, Spain), Light Mix Roche (Berlin, Germany), Logix Smart (Utah, USA), 1 Copy (Korea Republic), and RIDA GENE (Darmstadt, Germany). RNA was isolated either manually or automatically (QIAmp Viral RNA and SMART-32, DAAN GENE kits, respectively) from naso and oro pharyngeal swabs from suspicious individuals living in Mexico city and outskirts. **Results**: Since May 2020, when we received InDRE´s SARS-COV2 diagnostic approval, we have processed nearly 20,000 naso and oro-pharyngel swabs samples. The qualification of kits, as per their analytical performance, value of their controls, and convenience (mono versus multiplex) resulted in the following ranking from the most to the least convenient: 1) RIDA, 2) Vircell, 3) Roche, 4) 1 Copy, and 5) Logix Smart. **Conclusions:** Both, analytical performance and convenience to process quantious parallel samples in a short period of time, and particularly sensitivity, were key parameters for our laboratory to adopt either RIDA or Vircell kits. They are particularly useful in cases with low viral load, which even if asymptomatics, can be contagious for vulnerable subjects within their families, community, and at work.

Keywords: COVID-19, SARS-CoV2, RT-PCR TECHNIQUE.

INVESTIGATING *MONODELPHIS DOMESTICA* AS AN ALTERNATIVE TO THE *MUS MUSCULUS* AS AN ANIMAL MODEL.

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Faculty Mentor: Mario Gil, Ph.D.

Background: Mus Musculus is one of the first and one of the most widely used animal models in current neuroscience literature (Phifer-Riley & Nachmann, 2015). However, the research community needs alternatives to rodent models to study the mammalian brain. Research is needed to see if antibodies that target tyrosine hydroxylase, which are well researched in mice, can also be used to study the *Monodelphis domestica* brain. **Objective:** The *Monodelphis domestica* is a marsupial, their pups are born underdeveloped and easily accessible, and are thus excellent models for tracking neurodevelopment (Baggott & Moore, 1990). The objective of the present study is to consider the similarities and differences between the Mus Musculus and the *Monodelphis*. **Methods**: Following transcardial perfusions and brain extractions, mouse and opossum brains were processed and stained for tyrosine hydroxylase (and with Nissl). Opossum brains will then be sliced and processed using IHC methods to compare two TH antibodies (EMD Millipore and Pelfreeze). **Results:** Difference include that the *Monodelphis* has a much larger ventricle in the forebrain area and the mouse brain corpus callosum forms and fuses before the hippocampus compared to the opossum brain, where these fibers are formed more posterior to the formation of the hippocampus. The corpus callosum of the *Monodelphisis* also less prominent than the anterior commissure. The mouse hippocampus is well defined and begins formation after the formation of the corpus callosum, whereas *Monodelphis* hippocampus is not as defined. The results of the different antibodies will be available before the symposium. **Discussion:** The difference in ventricular size could indicate densely packed neurons or less overall neurons in the *Monodelphis* compared with the mouse. In humans and the mouse brain, the majority of the nerve fibers are found in the corpus callosum as opposed to the anterior commissure; the opposite is true for the *Monodelphis*. The corpus callosum is an important feature that allows communication between both hemispheres of the brain. Considering that the hippocampus is implicated in memory and that the *Mus musculus* is a social animal, the more defined hippocampus could be an evolutionary improvement for social interaction. The *Monodelphisis* a more territorial and isolated species, so their brains are presumably less adapted for social interactions. **Conclusions:** Although there are differences between the mouse and the opossum brain, there are also many similarities. Further research is needed to determine what these differences could mean in behavior and cognition. Both EMD Millipore and Pelfreeze make TH antibodies that have been looked at in mice and replicated. More research is needed to determine if the antibodies can be used for other animals, including the *Monodelphis*.

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CYCLOPHOSPHAMIDE AND EPIRUBICIN INDUCE APOPTOTIC CELL DEATH IN MICROGLIA CELLS

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Background. Chemotherapy Related Cognitive Impairment's (CRCI), diminish patient's quality life, being breast cancer (BC) patients the most affected. Microglia is described to play a major role in CRCI; hence, the aim of this research was to describe the cytotoxicity of cyclophosphamide (CTX) and Epirubicin (EPI), on microglia (SIM-A9), compared to BC cells (4T1). **Methods.** We assessed cell viability (Resazurin) and cell death (AnnV), as well as nuclear damage with γ-H2AX, p53, p16 and cell cycle analysis (PI staining) by flow cytometry (FC). Furthermore, we evaluated ΔΨm (DIOC6), ROS (DCFDA) and NO (DAF-FM) production. Finally, caspase activation (TF2-VAD-FMK) and autophagy (CYTO-ID). **Results.**

Chemotherapies decrease microglia-cell viability and increase cell death in concentration dependent manner. Increases in p53, p16and γ-H2AX and, cell cycle arrest was noted by CTX and EPI in SIMA-9 and 4T1 cells. Furthermore, Chemotherapy treatment induces, loss of ΔΨm, and ROS production on SIM-A9and 4T1, demonstrating that NAC decreases EPI-induced cell death in SIM-A9 and CTX-induced in 4T1. Moreover, caspase activation increases with treatments and its pharmacological blockade inhibits CTX and EPI induced-cell death. Autophagosome formation was observed by EPI and CTX treatment in SIM-A9 as a protective mechanism. Lower EPI concentrations induced cell cycle arrest, γ-H2AX, NO production and pro-inflammatory cytokine release. **Conclusions.** Chemotherapies induce higher cytotoxicity in microglia than in BC cells. ROS and caspase-dependent, as well as caspase dependent cell death was observed after EPI and CTX treatment in microglia respectively. Low concentrations of EPI induce DNA damage, NO production and cytokine dysregulation.

THE IMPACT OF BIOLOGICAL SEX ON MOTOR FUNCTION AND RESPONSES TO NOVEL ENVIRONMENTS IN THE GRAY SHORT-TAILED OPOSSUM (*MONODELPHIS DOMESTICA*).

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Background: Understanding the different stress reactions in different environments can help us understand stress factors. Studying animal behavior is important for translational research for mental health improvement. Previous literature has shown that stress is a risk factor for higher cancer incidence and poorer cancer survival. (Klejbor & Turlejski., 2012), as well as mental health outcomes. Understanding of how stress is related to cancer can help improve therapeutic outcomes as preventive measures (Glaser et al., 1987). **Methods:** Using the Rota Rod apparatus, 12 animals (3 males, 9 females) were tested at 36 rpm for a maximum of 400 seconds (Madroñalet al., 2010). Open field apparatus was used to test 8 animals (4males, 4 females), their locomotor and non-locomotor behaviors were recorded using AnyMaze. Data collected from both experiments were analyzed with SPSS software. **Results:** The preliminary results showed sex differences, female's average number of revolutions (44.54) was higher than their male counterparts (26.15). Results from the open field showed females exhibit less immobile episodes ($f(1)=6.000$. $p<0.05$). The results indicate that females had higher mobility duration than their male counterparts. **Conclusions:** Previous literature has shown stress is a risk factor and a major contributor to mental and physical health problems. Preliminary results support the hypothesis that there is a biological component in stress reactivity to novel environments in the *Monodelphis*, and that animal models are a good alternative to study sex differences in stress responses and motor function. Further research is needed to test housing effects in the short-tailed opossums.

SPECIFIC EDUCATIONAL NEEDS DETECTION IN AUTISM SPECTRUM DISORDER (ASD) IN SUPERIOR MIDDLE LEVEL STUDENTS

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Purpose: Detection ASD and intervention in superior middle level students at Universidad Autónoma de Nuevo León (UANL), Mexico.
Description: Upon admission to superior middle level at UANL, modified Gilliam Asperger's disorder scale (GADS) was applied to parents in a Program to identify behavioral characteristics associated to ASD. Parents of students with positive

GADS were informed and students were scheduled for standard psychological testing in order to evaluate cognitive process, study habits, social anxiety and self-esteem, prior to an intervention. From 2014 to 2020, 178 013 GADS were applied; there were 332 (0.19%) students with definite or suggestive pattern of ASD. Among them, 247 (74.4%) consented to continue in Program to receive psychologic and pedagogic intervention, according to found needs. During program, an intense collaboration of all superior middle level education Departments at UANL was shown. This Program promotes inclusive education in order to transform the learning process so that educational needs of ADS students are met. This implies a team effort with clear levels of responsibilities and fields of action.
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PSYCHOACTIVE SUBSTANCES CONSUMERS AMONG HIGH SCHOOL STUDENTS: DETECTION AND INTERVENTION

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Purpose: Identify and treat psychoactive substances consumers (PSC) among high school students at Universidad Autónoma de Nuevo León (UANL); México.
Description: A two-phase program (detection and intervention) was designed. Phase one included urine drug testing (UDT) either from direct aleatory sampling or referrals from within university departments under informed consent. Phase two for positive PSC, included an interview for psychological needs identification and cognitive behavioral intervention planning. Between 2017 and 2019, 490 UDT were performed. Results showed 235 PSC (47.9%), 86.4% were males (203) and 13.6% females (32). Most detected substance was cannabis: 218 students (92.7%); less frequent substances detected were cocaine, benzodiazepine, amphetamine and methamphetamine. A mean of 8 intervention sessions per student performed equaled more than 1800 sessions. Tight collaboration in between diverse University Departments was a key. An early PSC detection and intervention offers socioemotional tools to improve academic performance and life project.
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STANDARDIZATION OF A TECHNIQUE FOR OBTAINING DNA FROM FOOTPRINTS

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Currently our country has high numbers of missing persons, Tamaulipas being one of the states with the highest rate of disappearances. The identification of people has become more important thanks to the development of molecular techniques. However, the limitations are very high, because it is necessary to compare the genetic pattern of the disappeared with the parents. Therefore, the objective of this research is to standardize a genomic DNA extraction technique from contact surfaces for its subsequent implementation in the identification of disappeared, allowing the comparison of the genetic pattern with the disappeared itself. For this, genomic DNA extraction was carried out using the Phenol-Chloroform technique from fingerprint samples on a slide. The analysis was performed in duplicate on 5 fingerprint donors at various times; 24 hours, 7 days, 15 days, 30 days and the quality and concentration of DNA was

obtained by means of a Nanodrop spectrophotometer. An increase in DNA concentration was shown during the exposure time but a decrease in quality without presenting statistically significant differences ($p > 0.05$). These results may be because with the passing of days and exposure to the environment it interferes with the quality of DNA due to the presence of nucleases.

NOVEL NANOPARTICLE FORMULATION OF SABIZABULIN (VERU-111) FOR PANCREATIC CANCER TREATMENT

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BACKGROUND: Pancreatic cancer (PanCa) is one of the leading causes of cancer-related mortality in the United States due to very limited therapeutic options. Thus, developing novel therapeutic strategies will help for the management of this disease. We recently identified VERU-111, a novel synthetic molecule which showed potent anti-cancer effect against PanCa via targeting clinically important βIII and βIV tubulin isoforms. In this study, we synthesized and characterized its novel nanoformulation (MNP-VERU) and evaluated its therapeutic effects *in vitro* and xenograft mouse model. **Methods:** MNPs were prepared by chemical precipitation method and loaded with VERU-111 using diffusion method. This formulation was characterized for particle size, chemical composition, and drug loading efficiency, using various physico-chemical methods (TEM, FT-IR, DSC, TGA, and HPLC). The internalization of MNP-VERU was achieved after 6 hours incubation with MNP-VERU in PanCa cells. To determine therapeutic efficacy of MNP-VERU, we performed various *in vitro* (MTS, wound healing, boyden chamber real-time xCELLigence, and apoptosis assays) and *in vivo* (mouse tumor xenograft) studies using PanCa. Effect of MNP-VERU on various key oncogenic signaling pathways, and miRNAs was evaluated by Western blot, immunohistochemistry (IHC), confocal microscopy, qRT-PCR and *in situ* hybridization (ISH) analyses respectively. **Results:** Our novel MNP-VERU formulation provided average size of 110 nm in dynamic light scattering (DLS) and exhibited -8.23 to -11.65 mV zeta potential with an outstanding loading efficiency (94%). Cellular uptake and internalization studies demonstrate that MNP-VERU escape lysosomal degradation, providing efficient endosomal release to cytosol. MNP-VERU showed remarkable anti-cancer potential in various PanCa cells (Panc-1, AsPC-1, HPAF-II, BxPC-3, MiaPaca) and more effectively repressed βIII and βIV tubulin isoforms via restoring the expression of miR-200c. MNP-VERU more effectively suppressed AsPC-1 cells derived xenograft tumors in athymic nude mice. **Conclusions:** Taken together, our results suggest that MNP-VERU has more anti-cancer potential than free VERU-111 against PanCa. MNP-VERU may reduce the toxicity and improve the bioavailability of free VERU-111 and could be used for the management of PanCa and health disparity.

Keywords: Pancreatic cancer; Sabizabulin; VERU-111; Tubulin inhibitor; MNPs

TRIMERICINTERACTION OF ANTP-UBX WITH TBP AND HOMEOPROTEIN EXD IN THE GENETIC CONTROL OF DEVELOPMENT IN D. MELANOGASTER

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Homeoproteins specify body segments along the anteroposterior axis during embryo development; they bind DNA through the homeodomain (HD). Homeoproteins bind to similar and repetitive target sequences on DNA, raising the question of how they achieve functional specificity. Homeoproteins form complexes with proteins through the HDs or other regions. Antennapedia (Antp) and Ultrabithorax (Ubx) have an important role in conferring thorax identity; also they are involved in a repression transcriptional mechanism: Ubx binds to Antp promoter repressing its expression. We analyzed if Ubx and Antp perform protein-protein interaction as a regulation mechanism and if the complex Antp-Ubx are involved in trimeric interaction with other transcription factors. Using Bimolecular Fluorescence Complementation (BIFC) we showed Antp-Ubx interaction in cell culture and *in vivo* in embryos and imaginal discs of *Drosophila melanogaster*. Also, we detected the Antp HD importance as well as the E19G residue in the interaction. We next analyzed if dimer Antp-Ubxaffected Antp function in head involution on larvae, showing 80% of larvae with homeosis. In adult flies dimer Antp-Ubx caused a partial antenna to leg transformation. Additionally, using BiFC-based FRET, we showed that Antp-Ubx form trimeric complexes with TBP and EXD in cell culture and we test the trimeric complexes function *in vivo* in head involution on larvae, showing80% of homeosis expressing Antp-Ubx/TBP complex and 66% of homeosis expressing Antp-Ubx/EXD complex. We conclude that Antp-Ubx is involved in trimeric interaction with TBP and EX and both trimeric complexes are important for Antp function *in vivo*.

TRIMERIC COMPLEXES ARE INVOLVED TO TRANSCRIPTIONAL REGULATION IN DROSOPHILA MELANOGASTER DEVELOPMENT.

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Background: Homeoproteins are transcriptional factors (TFs) that shape animal body axes during development. These TFs are highly conserved and represent one of the most fascinating groups of regulatory molecules. Reports shown the multiplicity of interactions in hox proteins, as complexes trimeric involved to transcriptional activity. The study of trimeric complexes in Hox interactome will allow the better understanding of Hox genetic regulation during embryonic development. **Methodology:** Using a new combination BiFCFRET approach performed in HEK293, the quantification was performed by FRETTY of ImageJ. Fly crosses were incubated at 25ºC on standard yeast-agar-cornmeal medium. Embryo cuticle preparations were carried out according to (Gibson & Gehring 1998) and mounted on slides with Visicol. For adult imaging, the heads and antennae were dissected and directly transferred to microscopic slides without coverslips. The images were merged using the software HeliconFocus. **Results:** We found the presence of trimeric interactions of Antp-TBP-TFIIEβ and Antp-TBP-Exd in cell culture. Further were confirmed these trimeric interactions using Antp mutants. Interestingly, the trimeric Antp-TBP-TFIIEB shown diminish of homeotic effect caused by Antp in larvae. To analyze the effect in antenna-leg transformation we drive the trimeric complex and found inhibition of antenna-leg in head of *D. melanogaster*. Antp-TBP-TFIIEB shown homeotic reduction of 77% in larvae and found inhibition of 100% of antenna-leg transformation. **Conclusions:** Our results show that these trimeric interactions are involved in the genetic control of *Drosophila melanogaster*.

PREVALENCE OF HIGH-RISK HUMAN PAPILLOMAVIRUS TYPES IN NORTH-EASTERN MEXICO AND IMPLICATIONS

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Background: Human papillomavirus (HPV) is the most frequent sexually transmitted infection (STI) and the causal agent of cervical and penile cancers. Globally, 570,000 cases per year in women and 60,000 cases in men are attributable to HPV. HPV types 16 and 18 are the most prevalent high-risk (HR) viral types in tumors. We have used the database of our HPV diagnostic service to determine the prevalence of HR-HPV types in our population (North-Eastern Mexico) and its implications. **Methods:** Samples of 50 men and 50 women that were received in our laboratory from 2017 to 2021 were included. These were collected from penile swabs and cervical swabs, respectively. VPH presence was determined by polymerase chain reaction (PCR) and positive cases were subjected to Sanger DNA sequencing for viral genotyping. **Results:** In the positive cases of HR-HPV types of women over 40 years of age, the prevalence of viral type 16 was 100%, while in women under 40 years it was only 65%. The same was observed in men with those cases over 40 years of age exhibiting 96% prevalence of this type 16, and only 70% in the under 40 years old cases. **Conclusions:** Our findings suggest an inverse association of age with the prevalence of HR-HPV types. This may be due to the introduction of the multivalent vaccines mainly against HPV types 16 and 18 for teenagers in Mexico in 2006.

THE INTENSITY OF PHYSICAL ACTIVITY IMPROVES COGNITIVE PERFORMANCE AMONG AGING AMERICANS

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BACKGROUND: Currently there is no pharmacological cure for Alzheimer's disease and related dementias, physical activity (PA) has emerged as a promising approach. The optimal intensity of PA to improve cognitive health remains unknown. Therefore, this study aimed to evaluate associations between different durations and intensities of PA on performance across cognitive domains (executive function, processing speed, and memory) among aging Americans. **METHODS:** 2377 adults aged ≥60 years from the cross-sectional National Health and Nutrition Examination Survey 2011-2014, were included. Linear regression in hierarchical blocks and the size of effect (η2) were analyzed with R software. **RESULTS:** The mean age was 69.3±6.73, 50.86% females. Despite the attenuation of association following adjustments for covariates, participants who engaged in 3-6 hr/wk of vigorous-and > 1 hr/wk of moderate-intensity PA performed significantly higher in executive function and processing speed tests compared to inactive peers (η2= 0.005 & 0.007 respectively, $p<0.05$). However, there was no clear dose-response relationship between the executive function and processing speed test scores and duration of weekly moderate-intensity PA. For the adjusted model, the effects of 1-3 hr/wk of vigorous-intensity PA became trivial for the delayed recall memory test scores (β=0.33; 95% CI: -0.01, 0.67; η2=0.002; p=0.56). Interestingly, higher handgrip strength and higher late-life body-mass-index were associated with a higher performance across all cognitive domains. **CONCLUSION:** Observed associations provide evidence linking habitual PA with superior cognition health among older adults. Furthermore, increased muscle strength and higher late-life adiposity may impact cognition and require further investigation.

CHARACTERIZATION OF EPITHELIAL GROWTH FACTOR TRANSCRIPTS IDENTIFIED IN CROTALUS ATROX VENOM

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Keywords: Epithelial Growth Factor, fibroblasts, cancer, cellular pathways, transcripts, bacterial clones

Epithelial Growth Factor (EGF) is the primary source in regeneration and stimulation of essential fibroblasts cells commonly found in epithelium. Studies have shown that snake venom components are becoming a growing factor in treating illnesses such as cancer, muscular dystrophy, chronic pain, blood pressure, blood clotting, etc. EGF in human cells contains a promising quaternary structure that can bind to snake venom metalloproteinases, proposing a means of activating biochemical responses through protein-protein interactions to regulate unwanted cellular functions. This

supports promising research in achieving a greater understanding of regulation along cellular pathways through ligands, increasing the likelihood of targeting unwanted cellular growths (cancer), treating epithelial injuries, enhance pharmaceutical advancements, etc. The purpose of this study was to identify specific transcripts originating from snake venom. We cloned and retrieved the transcripts of EGF from the venom of Western Diamondback Rattlesnake (*C. atrox*). *C. atrox* carries a toxin that is known to carry Epidermal Growth Factor (EGF), a protein found in its venom. Messenger RNA from *C. atrox* crude venom was reverse-transcribed into cDNA and was further subjected to RT-PCR. The amplicons were purified from agarose gel and ligated into a pJET vector to obtain recombinant DNA found in bacterial colonies. At least three unique snake venom EGF transcripts were obtained after screening 23 bacterial clones using gel electrophoresis by molecular size and enzyme digestion patterns. More research would be essential to discovering protein-protein interactions that benefit treatments of illnesses and injuries along epithelium.

STRESS INDUCED lncRNA MALAT1 IN COLORECTAL CANCER HEALTH DISPARITY

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Background: Health disparities in the lower Rio Grande Valley are well documented and can play a critical role in cancer prognosis. Chronic stress, arguably exacerbated by these disparities, can also lead to a poor outcome after diagnosis through dysregulation of molecular markers known to be involved in cancer progression, resistance, and recurrence. lncRNA have been a relatively recent point of interest in the field of cancer research and play a role in cancer initiation and progression across tissue types. We have found that lncRNA MALAT1 is stress induced through transcription factor NFATc1. Here, we propose to investigate the association of stress factors with NFATc1and MALAT1 expression, and the role of these novel molecular drivers in CRC progression and metastasis. **Methods:** CRC tissues of different ethnicities were stained using Novel Z Probe based technology (lncRNA MALAT1) and immunohistochemistry (NFATc1). Stained tissues were scanned on digital scanner and scored. CRC cell lines were profiled for MALAT1 expression using RT-PCR. Lentiviral based overexpression (SW480) and knockdown (SW620) of MALAT1 in CRC cells was performed to study proliferation, invasion, migration, and colony forming capacity. **Results:** MALAT1 and NFATc1 expression was scored to be high in underserved population. MALAT1 expression was lower in less aggressive SW480 cell line as compared to highly metastatic SW620 cell line. Overexpression of MALAT1 in SW480, and knockdown in SW620 resulted in changes in their oncogenic profiles. **Conclusions:** Understanding the mechanistic roles molecular drivers influenced by biochemical stressors can provide pivotal information pertinent to CRC progression and metastasis.

WOMEN IN THE AREA OF HEALTH AND SCIENCE ON THE BORDER OF MEXICO BETWEEN TAMAULIPAS AND TEXAS

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Background: The border region between Mexico and Texas configures the space of binational, industrial, commercial and mercantile development, with great business openness on both sides of the border, where the cultural environment is marked by the altered way in which people develop on the border, where the man mostly exercises professional profiles related in the manufacturing maquiladoras area, industrial park, etc. while women are configured as

professionals mostly in the area of health services, education and others, but within this space women make their way to science within the development of scientific research, without being identified for the sake of the border, which are usually culturally not associated with the imaginary of the border. Knowing the incursion into this geographical region on both sides of the border, can strengthen and promote the development of women in science and scientific developments, but on addressing the gender gaps in this sector that can also be addressed binationally. **Case presentation:** One of the main reasons why we want to participate, is due to the need to expose the professional practice of women in the area of health who live in the region of the border formed between Reynosa, Tamaulipas and the Texas Valley towards Science. With the aim of transmitting the way in which the female gender stands out in the areas of scientific research within the national system of researchers and the gaps of opportunity for early training towards science in the border of Tamaulipas. We consider important the dissemination of information within the event, given that the research and development tasks in science in the border area is developed by women breaking professional stereotypes, but also promoting the path to training in science in early training. **Conclusions:** Women currently form part of 30% of the total number of researchers in the world, Mexico the participation of women in science is 37%, in the national system of researchers in Mexico there are 33 166 women in the various areas of knowledge, distinguishes the percentage of women in activities dedicated to health in (medicine) , public health, ext.) In the mexican Republic and even more in the border territoriality in Tamaulipas, it will allow to know and distinguish the gender gaps for the strengthening of the border entity.

MUTATIONAL AND EXPRESSION ANALYSIS OF FBXW7 GENE IN COLORECTAL CANCER PATIENTS AMONG NORTH INDIAN POPULATION

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Background: Colorectal cancer is the third most common cancer worldwide with the incidence rate of 1.8 million (10.2%) (GOBOCON-2018). The current study was designed to explore the possible correlation between that FBXW7 and colorectal cancer progression. **Methods:** FBXW7 gene mutations and expression was analysed in 173 colorectal carcinoma tissues along with the adjacent non-cancerous matched tissues using polymerase chain reaction-single stranded confirmation polymorphism assay. Gene expression analysis was conducted using qRT-PCR, western blot and IHC. **Results:** In total, six mutations were found in the FBXW7 gene, including four missense mutations, one frameshift deletion mutation, and one nonsense mutation. In expression analysis FBXW7 protein was found to be low in tumor tissues compared with matched normal tissues. Further, expression of FBXW7 was found highly significant with clinic-pathological characteristics like alcohol (p=0.006), dwelling (p= 0.004) and tumor stage (p=0.003). The overall expression of FBXW7 was low about 56.6%in tumor tissue samples. **Conclusion:** A strong association was found between the low expression of FBXW7 and the progression of CRC. We highly recommend FBXW7 as a new biomarker with therapeutic potential in CRC.
Key words: Colorectal cancer, FBXW7, SSCP, Mutation, Expression, Biomarkers

THE ROLE OF ZINC IN PSD-95 PALMITOYL MODIFICATION

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Postsynaptic density-95 (PSD-95) is a membrane-associated guanylate kinase that mediates localization of receptors in the excitatory postsynaptic density. It has been reported that PSD-95 mediates postsynaptic localization of NMDA receptors and anchors postsynaptic AMPAR receptors mainly through its postsynaptic membrane targeting by its N-terminal palmitoylation. Recent studies have shown that Ca2+/calmodulin blocks palmitoylation of PSD-95 by binding at the N-terminus of PSD-95, which promotes dissociation of PSD-95 from the postsynaptic membrane and causes loss of surface AMPARs in cultured neurons. Another metal ion zinc is found in various areas of the brain. As an

endogenous neuromodulator, zinc plays a role in synaptic transmission and is important in the maintenance of postsynaptic density stability. However, whether or notZn2+interacts with PSD-95 and regulates PSD-95 modification remain unknown. This study was carried out in human embryonic kidney 293 (HEK-293) cells. Cells were transfected with PSD-95 plasmids. After incubation for 48 hours, the cells were stimulated with 0.1 mM ZnCl2for 5 min. And then the cells were harvested and the palmitoylation ofPSD-95 was assessed using acyl-biotinyl exchange (ABE) method and Western blot. PBS was used in the control group in place of the ZnCl2. Our data showed that zinc stimulation decreased PSD-95 palmitoylation by 40%. The potential effect of the Zn2+-induced depalmitoylation of PSD-95 will be further studied, such as PSD-95 postsynaptic stability and PSD-95 postsynaptic localization. And more work needs to be done to unveil the mechanism underlying the impact of the depalmitoylation of PSD-95 on the postsynaptic localization of NMDARs and AMPRs in response to zinc stimulation.

PHARMACOECONOMICS OF METASTATIC COLORECTAL CANCER TREATMENT WITH TARGETED THERAPIES GUIDED BY COMPANION MOLECULAR DIAGNOSTICS

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Background: To guide the treatment with monoclonal antibodies (MAbs) against the epidermal growth factor receptor (EGFR) of metastatic colorectal cancer (mCRC), the FDA recommends prior companion molecular diagnosis (CMDx). It initially recommended screening for mutations in exon 2 of the KRAS gene, and most recently to extend to screening to exons 2, 3, and 4 of KRAS and 2, 3, and 4 of NRAS genes; furthermore, to evaluate the BRAF exon 15 mutation status (including V600E). To date, no studies have been done to compare the cost-benefit of these different CMDXs. **Methods**: We have compared the cost of treatment without prior CMDx versus the cost of standard KRAS (exon 2) testing followed by appropriate antiEGFR MAbs treatment. We have also compared these two modalities with the costs of the extended RAS and BRAF testing combined with appropriate therapies. Our pharmacoeconomics (PKE) estimations were based on 10 hypothetical cases of mCRC with mutation prevalence as previously reported by our laboratory. **Results:** The therapy cost per patient for treating mCRC with MAbs but without CMDx was estimated at USD 107,345.20. Using guided therapy based on standard KRAS testing approximately 65% of the patients would have been treated with the targeted therapy. Of these patients, close to one-fourth could still be harboring clinically relevant mutations in the remainder of the codons of both RAS genes or BRA exon 15, with potentially ineffective (KRAS mutants) or partially effective (BRAF mutants) treatment outcomes. On the other hand, beneficial treatments based on extended RAS testing would be prescribed to 50% of the patients with wild-type status. Finally, based on PKE considerations and the direct costs of antiEGFR MAbs treatment, the standard CMDx protocol results in a35% cost saving by avoiding the prescription of ineffective treatments to patients harboring clinically relevant mutations whereas application of the extended CMDx would result in a 45%. **Conclusions**: Even with the inclusion of the cost of testing, the treatment of mCRC with MAbs is more beneficial when guided by the extended RAS+BRAF CMDx as opposed to treatments guided by standard KRAS genetic testing. Furthermore, the patients excluded from ineffective therapies will save resources and time that can be used in seeking more suitable therapeutic alternatives.

CORRELATION BETWEEN CT-VALUES AND SYMPTOMS OF COVID-19 PATIENTS

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Background: Currently available RT-PCR methods for the diagnosis of COVID-19 can give an estimate of the viral load. The

cycle threshold value (Ct-value) of the PCR correlates inversely with the viral load; low Ct-values indicate high viral loads and vice versa. Higher viral loads have been seen to correlate with disease severity and infectivity. Therefore, we studied the correlation of the Ct-value of RT-PCR and the most common symptoms of COVID-19 individually. **Methods:** A prospective and descriptive study was carried out with the subjects that attended our laboratory for a COVID-19 test from September 14, 2020, to January 30, 2021. Subjects filled out a questionnaire with demographic and clinical information prior to taking the naso and oropharyngeal samples. The samples were processed by Vircell SARS-CoV-2 Real-time PCR Kit (Granada, Spain). Statistical analyses were performed using IBM SPSS software. **Results:** We included 657 positive subjects with complete information, with a median age of 36 (27-47) and a male predominance of 477 (72.6%). Of these, 395 (60.1%) were symptomatic and the median number of symptoms was 2 (0-5). The most predominant symptoms were headache 271 (68.6%), cough 229 (58%), and myalgias 180 (45.6%). The median Ct-value for gene N was 30 (23-36) and for gene E was 31 (23-35). In comparison between symptomatic and asymptomatic subjects, asymptomatic patients had a higher Ct-value (lower viral load) in both genes and a lower age ($p<0.001$). Within the symptomatic, when compared by specific symptoms, the Ct-value was statistically significantly lower (viral load higher) in headache, cough, and fever; and higher (viral load lower) in dyspnea, anosmia/ageusia, and diarrhea. **Conclusions:** The viral load correlates with symptoms within COVID-19, having found that higher viral loads were correlated with symptoms such as headache, cough, and fever, while lower viral loads were correlated with dyspnea, diarrhea, and alterations of smell or taste senses.

CHROMIUM PICOLINATE, BIOTIN, AND SODIUM BICARBONATE COMBINATION AS A DIETARY SUPPLEMENT IN THE TREATMENT OF TYPE 2 DIABETES

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Background: Type 2 diabetes mellitus (T2DM) is characterized by hyperglycemia due to insulin resistance, which can lead to micro and macrovascular complications. The importance of glycemic control for prevention demands the need to promote accessible and safe treatments such as scientifically-proven nutritional supplements, such as chromium picolinate and biotin. Previous studies have suggested that the consumption of bicarbonate-rich mineral water altered blood metabolites and gut microbiome which had beneficial effects on patients with T2DM. The objective of our study was to evaluate the supplementation with chromium picolinate, biotin, and sodium bicarbonate in patients with T2DM. **Methods:** We planned and supervised the execution of a crossover, randomized, double-blind, placebo-controlled study of patients with the diagnosis of T2DM that was conducted in the University Hospital "Dr. José E. González" of the Autonomous University of Nuevo Leon in Monterrey, Mexico from June 2011 to July 2012. Patients' contacts during the study included a day-0 baseline visit and six more visits over the next six months. Efficacy of treatment was assessed by expressing changes in hemoglobin A1c (HbA1c), body mass index (BMI), and blood pressure (BP). **Results:** Forty-seven (62.6%) of the original 75 patients completed the trial. Regarding the baseline characteristics, 25 (53.1%) of the participants were male and the mean age was 55.23 ± 9.88. The mean HbA1c was 8.38 ± 1.08%, the mean BMI was 29.34 ± 4.64, the mean systolic BP of 143.84 ± 23.6 mm Hg, and the mean diastolic BP of 84.5 ± 12.13 mm Hg. When comparing the changes that occurred after both interventions, we observed that the HbA1c in the active principle group decreased (-0.15%) and in the placebo increased (+0.12%) ($p=0.148$). When we subdivided both groups according to their HbA1c level prior to the intervention, we compared the participants with HbA1c ≥9, the placebo group had an increase of 0.15 ± 1.32 % and the reduction in the active principle was -0.68 ± 1.58 % ($p=0.158$). **Conclusions**: In our study, we observed that the supplementation with chromium picolinate, biotin, and sodium bicarbonate decreased HbA1c in a period of 3 months compared to the placebo group in which there was an increase, but without a statistically significant difference. We believe that this could be due to two reasons: the size of our sample, due to the large percentage of participants who dropped out of the study, or because the treatment period to observe a greater difference should have been longer.

FORNIX VOLUMETRIC INCREASE DURING AGING ASSOCIATES TO MICROGLIA ACTIVATION LEADING TO DEFECTIVE COGNITIVE PERFORMANCE

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Background: Ageing displays a low-grade pro-inflammatory profile in blood and brain. It has been documented proinflammatory cytokines accumulation leading to neuroinflammation during aging. Aged brains integrate pro inflammatory cytokines accumulation, active microglia and volumetric changes which correlates with defective cognitive performance and neurodegeneration. **Methods:** Mice from 2-,12-and 20-months-old of age were submitted to different memory tests: Y-maze, Barnes maze, object location test and object location test. Afterwards, we performed structural MRI to evaluate macrostructural changes related to memory and learning regions. Following this, we also evaluated in peripheral blood and in brain tissue the presence of pro-inflammatory cytokines using the BioPlex platform. We also evaluated the presence of microglia and its morphology. **Results:** We found a progressive memory loss in an age-dependent manner among in the 12-and 20-months-old mice when compared with the 2-month-old mice. Regarding the MRI, it demonstrated that the fornix volume increased the most and, the left medial entorhinal cortex showed the most volume loss. Microglia number was augmented in fornix and decreased in medial entorhinal cortex which correlated with volume gain or loss, respectively. Microglia morphology was dystrophic and activated in fornix and in a “surveillance” phenotype in the medial entorhinal cortex. We found these phenotypes to be correlated to those volume changes we found in fornix and left medial entorhinal cortex. **Conclusions:** Here, we selectively identified an age-dependent proinflammatory profile and microglia activation favoring major volumetric brain changes in selective regions associated to cognitive decline in aged mice.

SYNTHESIS AND INVESTIGATION INTO THE ESTROGEN RECEPTOR ANTAGONIST ACTIVITY OF ISOFLAVANS AND THEIR SYNTHETIC DERIVATIVES

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Abstract

Background: Breast cancer (BC) is the most invasive and prevalent cancer in women in South Africa, with numbers as high as 1 in 8 women in urban areas and with a large percentage being ER-positive (ER+). ER+ BC cells are reliant on the binding of the natural ligand 17β-estradiol (E2) to ERα and ERβ isoforms which drives tumor growth1. ER antagonists and inhibitors of estrogen synthesis are therefore widely used therapeutic agents in the treatment of BC. Isoflavans are natural products found in many dietary plants. They are phytoestrogens, able to act as natural anti-breast cancer agents, acting as ER antagonists 3.

Method: The aim of the study is to investigate the ER antagonist activity of natural isoflavans and their synthetic derivatives. We are synthesizing a small library of non-natural isoflavans which have different substituents at the 4’-position of the isoflavan ring. The synthesis makes use of a [4+2] cycloaddition reaction between an o-quinone methide and the aryl-substituted enol ether based on a method by Gharpure et al2. The synthesized compounds will be tested using a luciferase reporter assay to establish if they have antagonist activity in CV1 cells expressing the ER.

Results: Results pending

Conclusion: In this project, we aim to develop new chemistry for isoflavans and to establish isoflavan structure-activity relationships. The results of the study may aid in the future design of more potent ER receptor antagonists for breast cancer therapy.

ANTP TRANSCRIPTIONAL ACTIVITY IS MODULATED BY THE FORMATION OF THE TRIMERIC ANTP-TBP COMPLEXES WITH TFIIEβ, EXD AND BIP2

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Homeoproteins are transcriptional factors that bind to DNA through a highly conserved binding domain known as the homeodomain (HD) which recognizes short regions rich in A-T to control the development of the body appendages of organisms. However, their structural and recognition similarities make it difficult to explain how homeoproteins are capable of carrying out their function. Previous results have shown that Antp homeoprotein can establish dimeric interactions with TBP, TFIIEβ, Exd, BIP2 and more recently through BiFC-FRET we confirmed that Antp and TBP can form trimeric complexes with TFIIEβ/Exd/BIP2. Therefore, is important to show how these trimeric complexes modulate Antptranscriptional activity. The experimental approach selected for this project was to perform *in vitro* transactivation assays in HEK-293 cells transfected with the combinations of Antp and TBP-producing plasmids with TFIIEβ/ Exd / BIP2 plasmids using a Luciferase reporter plasmid. Our results show that trimeric interaction of Antp-TBP-TFIIEβ induced a significant increase of 138%in the Antp transcriptional activity. By contrast, trimeric complexes of Antp-TBP-Exd and Antp-TBP-BIP2 modified the transactivating capacity of Antp, decreasing transcription by 20 and 26% respectively. According to this, we were able to confirm that the trimeric complexes Antp-TBP/TFIIEβ/Exd/BIP2 are involved in the modulation of Antp transcriptional activity. So, now it is interesting to analyze how these trimeric complexes are involved in the activation and/or repression of target genes of Antp during genetic control of development in *Drosophila melanogaster*.

A NOVEL EXO-GLOW NANO-SYSTEM FOR CELLULAR IMAGING

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Background: Indocyanine green (ICG)based Near-Infrared (NIR) fluorescent imaging is an attractive and safer technique used for number of clinical applications. However, ICG tend to have poor photostability, short half-life, non-specific proteins binding, and concentration-dependent aggregation. Therefore, there is an unmet clinical need to develop newer modalities to package and deliver ICG. Bovine milk exosomes are natural, biocompatible, safe, and feasible nanocarriers that facilitate the delivery of micro and macro molecules. Herein, we developed a novel exosomes based ICG nano imaging system that offers improved solubility and photostability of ICG. **Methods:** Following acetic acid based extracellular vesicles (EV)extraction method, we extracted the bovine milk exosomes from a variety of pasteurized fat-free milks. The EVs were screened for their physicochemical properties such as particle size and concentration, and zeta potential. Stability of these exosomes was also determined under different conditions including storage temperatures, pH, and salt concentrations. Next, ICG dye was loaded into these exosomes (Exo-Glow) *via* sonication method and further assessed for its fluorescence intensity and photostability using an IVIS imaging system. **Results:** Initial screening suggested that size of the selected bovine milk exosomes was from 100-135 nm with an average particle concentration of 5.8x102 particles/mL. Exo-Glow (ICG loaded exosomes) further showed higher fluorescence intensity of ~2x1010 MFI compared to free ICG (~ 8.1x109MFI). **Conclusions:** These results showed that Exo-Glow has the potential to improve solubility, photostability, and biocompatibility of ICG and ma serve as a safer NIR imaging tool for cells/tissues.

AWARENESS OF GENETIC TESTING FOR HIGH-RISK CANCER AMONG DIFFERENT RACIAL GROUPS IN THE UNITED STATES

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Background: Genetic testing for high-risk cancer can provide information on personal risk of developing cancer, as well as diagnosis, prognosis and treatment once cancer has been detected. **Methods:** Data for this study were obtained from the Health Information National Trends (HINTS 5,Cycle 4), conducted among U.S. adults (age ≥ 18 years)from February 24 to June 20, 2020. An equal probability sample of addresses were stratified, and an adult was selected from each household. Data analysis was conducted 3,865 respondents who completed the survey. The primary outcome was awareness of genetic testing for high-risk cancer(GTHC). We used weighted multivariable logistic regression to determine the awareness of genetic testing for high-risk cancer, adjusting forage, gender, race/ethnicity, education, household income, general health status and history of cancer. **Results:** We found a significant association between race/ethnicity and awareness of GTHC. Non-Hispanic Black and Hispanic respondents were less likely to be aware GTHC, compared to White respondents (Non-Hispanic Black: aOR=0.53; 95%CI: 0.32–0.87. Hispanic: aOR=0.58; 95%CI: 0.36–0.95). The awareness of ancestry testing was also significantly associated with awareness of GTHC(aOR=5.62; 95%CI: 2.95–10.72). Female respondents were more likely to be aware of GTHC compared to males (aOR=1.92; 95%CI: 1.37-2.68), and relative to respondents 50-64 years, those 35-49 years were more likely to be aware of GTHC (aOR=1.92; 95%CI: 1.37-2.68). **Conclusion:** This cross-sectional study showed less awareness of genetic testing for high-risk cancer among non-Hispanic Black and Hispanic groups, highlighting the need for more health education among minority racial groups.
Keywords: Cancer morbidity; Diagnosis; Ethnicity; Genetic testing; Race; Screening.

PERFORMING A HIGH-THROUGHPUT VIRTUAL SCREENING (HVTS) TO IDENTIFY POTENTIAL THERAPEUTIC TARGETS OF YB-1 PROTEIN

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Background: Hepatocellular carcinomas (HCCs) is a primary malignancy of the liver. Hispanic-Texans have several risk factors and disparities that compound the risk of HCC diagnosis and treatment. The most used chemotherapeutic drug against HCC is sorafenib, but many liver cancers have developed a resistance to this drug. The knockdown of Y-box binding protein-1 (YB-1) has been shown to greatly increase sensitivity to sorafenib. In this study, we will discuss identification of potential YB-1 inhibitors, which can lead to re-sensitization of liver cancer cells to sorafenib. **Methodology:** The RCSB protein data bank (pdb) was used to retrieve the crystal structure of YB1, while the DrugBank database was used to obtain a list of experimental and approved drugs. A multiple sequence alignment (MSA) of YB-1 & Lin28 was done by Clustal Omega. Biovia Discovery Studio 2020 was used to visualize 3D models and perform a High-Throughput Virtual Screening (HTVS), which includes rigid docking via the LibDock extension, flexible docking via the CDocker extension, and a pharmacokinetic profiling via an ADMET analysis. **Results:** The cold shock domain of YB-1 was found to be conserved with Lin28,as a known transcription factor. 22 drug candidates were identified through HTVS. The best six show a decent binding ability in both rigid and flexible dockings and have been previously tested in different cancer types to some extent. **Conclusion:** We were able to identify six potential drug candidates for inhibiting our protein of interest, YB-1. Studies are in progress to testthem on sorafenib-resistant HCC cell lines.

TOX3 RS3803662 POLYMORPHISM IS ASSOCIATED WITH BREAST CANCER PROTECTION IN NORTHEASTERN MEXICAN WOMAN.

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Introduction: Low penetrance genes are involved in breast cancer (BC) and confer risk for the development of this neoplasia. Different single nucleotide polymorphisms (SNPs) associated with BC have been identified, such as rs3803662 (TOX3), which is related to estrogen receptors in European and African-American women. The contribution of this variant in the Mexican population is unknown. The objective of this study was to evaluate, through a case-control design, the association of the SNP rs3803662 (TOX3), with the risk of BC in women from northeastern Mexico. **Methods:** We included 434 cases and 228 controls. Genotyping was carried out using RFLPs. The SPSS 7.0 statistical program was used to determine the gene frequencies, the estimation of the relative risk (Odds ratio [OR]),and the Hardy-Weinberg equilibrium (EHW). **Results:** The homocygote (T/T) genotype of the SNP TOX3 rs3803662 was identified as a protective allele for BC (OR: 0.47, 95% CI: 0.29 -0.78). **Conclusions:** The Tallele of the SNP rs3803662 can be considered as a protective factor for BC from northeastern Mexico women.
Keywords: breast cancer, TOX3, rs3803662, Mexico, polymorphisms.

UNRAVELING THE MECHANISMS BY WHICH SMOKING AND ALCOHOL ALTER PANCREATIC CANCER PATHOGENESIS

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Background: Pancreatic cancer is the 3rdleading cause of cancer in United States with a 5-to-7-yearrelative survival rate. This can be attributed to the late onset of symptoms and diagnosis of the disease, which makes it unmanageable at its later stage. Ethnic differences in pancreatic cancer incidence have been reported, especially regarding higher incidence in African Americans. African Americans are more likely than Asian, Hispanic, or whites' people to develop pancreatic cancer. They have highest incidence rate between 28% and59% higher than other racial groups. The mortality rate for Blacks is 13.3 per 100,000 people, while for Whites it is 11.0 per 100,000.Incidence of pancreatic cancer and increased smoking and alcohol consumption among African Americans indicates lifestyle risk rather than genetics. The purpose of this study is to identify underlying mechanisms that may contribute to this racial disparity. Herein, we have demonstrated that cigarette smoking and alcohol consumption are associated with pancreatic cancer and poor patient survival. **Methods:** MUC13 was assessed in tissues using our in-house generated anti-MUC13 mouse monoclonal antibody and analyzed for clinical correlation by immunohistochemistry, immunoblotting, RT-PCR, computational and submicron scale mass-density fluctuation analyses, ROC and Kaplan Meir curve analyses. **Results:** Our results demonstrate that smoking and drinking alters tumor microenvironment and enhances bidirectional tumor-stromal cells interaction between sonic hedgehog (SHH) pathway and an oncogenic CXCR4/CXCL12 signaling axis. Our results particularly signify an aberrant overexpression of a mucin, MUC13 in the nuclear (NMCS) compartment of cells from the patient tissues who smoke or drink. **Conclusion:** This study analyzes the association of MUC13 with effects due to smoking and alcohol consumption. This study is significant in understanding potential risk factors in pancreatic cancer. Smoking and excess drinking cessation programs can help prevent pancreatic cancer.
Keywords: Pancreatic Cancer, Smoking, Alcohol, Ethnicity, Tumor stroma

ANTIBODY MEDIATED TARGETED DRUG DELIVERY SYSTEM TO IMPROVE IMMUNOTHERAPY IN PANCREATIC CANCER

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Background: About 95% of tumor arises from epithelial cell lining ducts known to be pancreatic ductal adenocarcinomas, with less than 5-7%survival rate. Unfortunately, little progress has been seen in the outcomes of patients with PDAC as tumor develops high desmoplasia and chemo-resistance to chemotherapeutic drugs, such as gemcitabine (Gem).Immunotherapy has shown promising results in cancers, except pancreatic cancer due to their characteristic fibrotic tumor microenvironment. The therapies are unable to penetrate to the fibrotic tumors leading to insufficient availability of the therapeutic drugs at the tumor site. A recently identified mucin, MUC13 is aberrantly expressed in pancreatic tumors but not in normal pancreas. This makesMUC13 as an excellent protein for specifically targeting pancreatic tumors. The aim of our study is to deliver stroma targeting drugs efficiently to pancreatic tumors that would soften the tumors to improve the response of checkpoint immunotherapies. The stroma targeting drug used is curcumin. This study is unique as it will utilize MUC13 antibodies for targeting the pancreatic tumor site and SPION nanoparticle system for delivering the stroma depleting drugs, which would help in improving immunotherapy response. **Methods:** In this project, we demonstrate a unique ability of our in-house generated mouse and humanized monoclonal antibody of MUC13 to penetrate and target pancreatic cancer. These antibodies have been conjugated with our recently developed novel patented superparamagnetic iron oxide nanoparticles (SPIONS). Conjugation efficiency of the SPION-Anti-MUC13 particles was seen through agarose gel studies followed by Cell uptake studies by measuring fluorescence intensity, Prussian blue staining. Internalization of SPION conjugated with different concentrations of Anti-MUC13 was checked by immunofluorescence assay. Invasion assay was carried out using BD Matrigel-coated chamber wells on HPAF-II cells. Migration assay was carried out on HPAF-II cells. We have used Panca orthotopic mice model for investigating tumor targeting efficacy of MUC13-MNP, conjugated with fluorescent indocyanine green (ICG) dye. **Results:** Our results demonstrate that our MUC13 antibody conjugated SPIONS can efficiently internalize the PDAC cells. SPION-MUC13 using Indocyanine dye (ICG)specifically reached to the tumor site in an orthotopic pancreatic cancer model as indicated by ICG fluorescence. MUC13-SPION formulation led to an enhanced uptake in MUC13 positive (MUC13+) PanCa cells, compared with MUC13 null (MUC13-) cells as demonstrated by immunofluorescence, Prussian blue staining. Interestingly, the formulation resulted in sustained delivery of curcumin (CUR), enhanced inhibition of cell proliferation, migration and invasion in MUC13+ cells as compared with MUC13-cells, which suggests the targeting efficacy of the formulation. Additionally, the formulation inhibited the tumor growth and metastasis in mice. **Conclusion:** The formulation softens up the tumors for therapies that can result in improved response to checkpoint immunotherapies. Therefore, this study indicates high significance of MUC13-SPIONS for achieving pancreatic tumor specific delivery of drugs. Efficient MUC13 conjugated SPION-CUR can potentiate checkpoint immunotherapies, inhibit tumor growth and its progression, which will be conducted in continuation in a pancreatic orthotopic mice model. This study has a potential to reduce morbidity and mortality caused by the disease and improve survival in patients.

Keywords: Nanodrug delivery system, Pancreatic ductal adenocarcinomas, Immune checkpoint inhibitors, Immunotherapy

GENETIC POLYMORPHISMS IN PARK2-EXONS ARE ASSOCIATED WITH COLORECTAL CANCER RISK IN NORTH INDIAN POPULATION

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Abstract

Background: Single nucleotide polymorphism (SNP) is the most abundant form of genetic variation among individuals. In various studies, it is found that the association of SNP in exonic regions of PARK2 causes the promotion of metabolic disorders like cancer. Globally, colorectal cancer is the most prevalent cancer type in both men and women. The association of SNPs in the development and recurrence of colorectal cancer in the North Indian Population has remained elusive. However, in the present study, we assessed the association between rs1801334 G1281A (Asp394 Asn) & rs1801474 G601A (Ser167Asn) polymorphisms and colorectal cancer (CRC) incidences among the North Indian population. **Methods:** In order to analyze the association of these polymorphisms with the risk of colorectal cancer, we genotyped 200 unrelated subjects (100 patients and 100 healthy controls). For this genomic DNA is isolated by using venous blood & SNPs were genotyped by the Polymerase Chain Reaction-Restriction Fragment Length Polymorphism method. **Results:** We observed that the Allele and genotype frequencies for the 2 polymorphisms in the PARK2 is differ between colorectal cancer patients and controls. **Conclusions:** Our finding, concludes that the genetic variation at the exonic regions of the PARK2 gene did contribute to the risk of developing colorectal cancer in the North Indian population. Therefore, in this study polymorphisms in the exonic region of the PARK2 gene could be useful to investigate the association with other cancer types in which parkin could be involved.
Keywords: Single Nucleotide Polymorphism, Colorectal cancer, genetic polymorphism

AUTOMATED VERSUS MANUAL RNA ISOLATION FOR THE LABORATORY DIAGNOSIS OF SARS-COV-2.

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Background: The rapid spread and huge health and economic impact witnessed even from the beginning of the COVID-19 pandemic prompted the development of diagnostic tests to opportunely identify individuals infected by its causing agent, the SARS CoV-2 virus. This is a prerequisite to quarantine them to avoid further spreading the infection specially to their vulnerable co-workers and family contacts. The golden standard for pathogen detection is the Polymerase Chain Reaction (PCR). To obtain an accurate result, it is important to carry out an optimal isolation of the viral RNA genome. **Methods:** This study aimed to compare manual (kits of Qiagen or DAAN) vs automatic (SMART- 32 equipment of DAAN) RNA isolation methods. 372 samples were processed of which 200 were negative and 172 were positive of which 181 were processed manually and 191 automatically. Pre-analytical characterization of the RNA resulting from both methods included quantification of yield and qualification of purity by spectrophotometry in the Nanodrop (Thermo Fisher, Mexico City). Results were comparatively evaluated employing the IBM SPSS Statistics software. **Results:** The median yield of RNA obtained by the manual method resulted higher than that rendered by the automatic method. Regarding purity (as judged by the ratios of $A_{260/230}$ and $A_{260/280}$) the manual method reflected better parameters than the automated one. On the other hand, when dealing with large amounts of samples, the latter was more convenient and faster. **Conclusions:** The manual method gives slighter better yield and purity than the automated one. However, quality wise, RNA from both methods is equally suitable for RT-PCR diagnosis of the SARS-CoV 2. The demand in the laboratory for processing large volumes in the minimal time, tips the scale to the automatic method.
Keywords: COVID-19, SARS-CoV2, RNA isolation, Manual, Automated, RT-PCR

BIOBANKING IN NE MEXICO FOR BIOMEDICAL RESEARCH AND CLINICAL NEEDS.

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Background: The advancement of biomedicine demands tools that translate its achievements into services to both the scientific community and the pharma/biotech industry. Biobanks are powerful tools that collect, process, store, manage, and distribute biospecimens and their associated clinical/demographic data to users carrying out studies aimed at causing a real public health impact. For our laboratory to offer pharma/biotech companies support for their projects with the highest quality possible biospecimens we adopted the Best Biobanking Practices from ISBER (https://www.isber.org/). **Methods:** As a result of the pandemics, great effort has been dedicated to help the health ecosystem through a diagnostic service for SARSCoV-2 (by RT-PCR). Emphasis was put on proper sample collection, preanalytical characterization, and storage in ultra-low freezers. Their pre-analytical characterization included determining yield and purity by spectrophotometry using the NanoDropTM2000 (Thermo-Fisher. Mexico City, Mexico). **Results:** We biobanked and supplied to internal (our Genetics laboratory) and external (validation protocols of pharma/biotech international companies) clients almost 2,000 RNA samples. Given the preanalytical qualification of the biospecimens, they performed satisfactorily for our clients' diagnostic and innovation protocols needs. **Conclusions:** The biobanking services provided to both our diagnostic laboratory and to pharma/biotech companies that contracted our services delivered research materials of the highest quality. Being a private biobank recognized now nationally and internationally by public and private institutions has allowed us to participate in projects evaluating innovative diagnostics methods and devices.

IMMUNEPOTENT CRP ENHANCES CYCLOPHOSPHAMIDE-INDUCED CYTOTOXICITY THROUGH A CASPASE INDEPENDENT BUT ROS DEPENDENT MECHANISM IN TRIPLE NEGATIVE-BREAST CANCER CELLS

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Background: Breast cancer (BC) is one of the leading causes of cancer death worldwide. Cyclophosphamide (CYP) remains a mainstay in cancer therapy mainly in the triple negative breast cancer subtype (TNBC) in spite of harmful adverse effects and cell death-resistances. To face this, combination of chemotherapies and immunotherapies has been proposed. IMMUNEPOTENTCRP (ICRP) is an immunotherapy that has cytotoxic effects in several cancer cells without affecting peripheral blood mononuclear cells (PBMC) and CD3+ cells, beside improving clinical parameters of chemotherapy-treated patients. The aim of this study was to evaluate the mechanism of cytotoxicity induced by ICRP in combination with CYP (ICRP+CYP) in TNBC cells and their effect in healthy cells. **Methods:** For this purpose, human and murine breast adenocarcinoma,MDA-MB-231and4T1cells, beside PBMC were treated for 24 hours with ICRP,CYP or ICRP+CYP in different combination ratios for the assessment of cell death. Flow cytometry was used to determine biochemical characteristics of cell death. **Results**: ANN/PI assays showed that ICRP+CYP induce cell cycle arrest in TNBC cells and potentiated cell death characterized by loss of mitochondrial membrane potential, reactive oxygen species(ROS) production and caspases activation. In addition, ICRP+CYP-cell death is ROS-dependent and caspases-independent in MDA-MB-231 and 4T1 cells. On the other hand, ICRP did not affect CYP-cytotoxicity in PBMC. **Conclusions:** For all the above, we can propose that the combination of ICRP with CYP is an effective combination therapy, promoting their use even in tumoral cells with defects on proteins implicated in the apoptotic pathway.

UNDERSTANDING AN INFLAMMATORY PATHWAY IN DIABETIC RETINOPATHY

Reanna Rodriguez

Introduction: Diabetic Retinopathy (DR) is the leading cause of blindness in the U.S. However, not much is known of its molecular pathway and how it attributes to increases in inflammatory response in the eye. One avenue we will investigate is the transforming growth factor beta (TGFB) signaling pathway and its effect of vascular endothelial growth factor (VEGF) secretion and cell viability. VEGF is the hallmark that exacerbates DR progression in prolonged diabetes. Some major concern that have arisen are the underlying effects of oxidants and antioxidants in elevating VEGF secretion in diabetes. In attempt to learn more, we evaluated how an oxidant (acrolein) and antioxidant (hypoxia) impact 661W cone photoreceptor cells in the retina. **Methods:** 661W cells were cultured in DMEM, 10% FBS, 1% AB and once confluent seeded into 6 wells with 300, 000 cells per well. Cells were conditioned in 5.5 and 30mM glucose, in addition to their appropriate treatments of hypoxia induce using cobalt chloride (CoCl2) and various concentrations of acrolein including 25, 50, 100, 200uM for a 24-hr. treatment period. Following the collection of conditioned media to measure VEGF secretion and cell viability to quantify number of viable cells using the hemocytometer. Moreover, to determine the role of TGFB signaling pathway inhibition will block the molecular pathway to determine how VEGF secretion and cell viability are affected in the respective treatments listed above. **Results:** Based on the iv data collected hypoxia has a significant impact on increasing the amount of VEGF secretion p=.002 and decrease cell viability p=.028. Additionally, acrolein played a significant role in decreasing cell viability and VEGF secretion in a dose dependent manner in 661W photoreceptor cells. Due to hypoxia and acrolein being known to affect oxidative pathways significantly, it is possible that their effects may be mediated by the TGFB pathway. Moreover, it is suggested that there is an additional increase in VEGF secretion and decrease in viable cells after inhibition of TGFB allowing us to believe that there is an additional part of the pathway that is contributing to these effects. **Conclusion:** Overall, hypoxia exerted a significant effect to reduce 661W cell viability and increase VEGF secretion and acrolein caused reduction of cell viability along with a decrease of VEGF secretion. Acrolein decreased the amount of both VEGF and cell viability in a dose dependent manner. To determine the role of TGFB signaling pathway, two inhibitors were used SMAD/SIS (1) and TGFB receptor 1 kinase (2) to inhibit the pathway from activation by inhibiting the receptor and inhibiting phosphorylation from occurring. By doing this we discovered that inhibitor 2 reduced the hypoxic induced VEGF increase in both NG and HG suggesting pathway involvement. Furthermore, we discovered that inhibitor 2, only, resulted in an increase of viable cells suggesting possible involvement as well. All in all, it seemed that the inhibitor 2 was effective in decreasing the VEGF secretion and increase viable cells to alleviate or reverse the effects seen in DR that include increased VEGF and decrease in viable cells.

ROLE OF POTE-2 IN HEPATOCELLULAR CARCINOMA PROGRESSION.

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Background: Hepatocellular carcinoma (HCC)accounts for 85-90% of primary liver cancers. The Hispanic population had an incidence of 21.2 per 100,000 in Texas. Particularly, the Rio Grande Valley (RGV) is an underserved area facing disparities that increase risk factors of HCC and thus, yielding higher incidence and mortality. Therefore, early, faster, and inexpensive diagnostic biomarkers and methods are crucial to under-resourced areas such as the RGV. Recently ,we have identified an extracellular cancer antigen,POTE-2. Preliminary data indicates high POTE-2 expression in HCC tumors. In this study, we will discuss the role of POTE-2 in HCC progression and its associated regulatory pathways. **Methods:** The Cancer Genome Atlas (TCGA) database of HCC patients (n=371 tumor; n=50 normal) was analyzed. Liver cancer cells were procured from ATCC. POTE-2 mRNA and protein expression analyzed via RT-PCR and western blot. Absolute copy number was determined using Digital Droplet PCR. Lentiviral-based plasmids were used for overexpression and

knockdown studies. Signaling pathways were analyzed using Proteome Profiler array. **Results:** Comprehensive analysis of TCGA databaserevealedhighPOTE-2 expression tumors with up regulation in all stages of HCC. POTE-2 expression increases with nodal metastatic status leading to poor survival. The protein expression for POTE-2 was significantly higher in SK-HEP1 compared to C3A cells. Lentiviral transduction showed significant overexpression and knockdown of the POTE-2 protein. Modulation of POTE-2 expression led to changes in lncRNA and kinase pathways. **Conclusion:** These studies will help discover novel mechanisms of POTE-2 protein function, signaling pathways and roles in liver cancer progression.

THERMAL DOSE INACTIVATION OF ESCHERICHIA COLI BY MAGNETIC INDUCED HYPERTHERMIA

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Abstract: Apoptosis of mutated cells via magnetic hyperthermia has gained advocacy as technology capable of being used in lieu of chemotherapy for minimizing cancer tumors. Progress of nanotechnology offers effective remote heating process of magnetic fluid by hyperthermia. The heating and specific power absorption of these nanoparticles are dependent on particle properties and treatment locations. In this report, we have investigated hyperthermia process of the positively charged dextran coated superparamagnetic iron oxide nanoparticles adhere to gram negative E.coli bacteria via electrostatic forces. The nanoparticles were fabricated using microfluidic system by interaction of a Solution A (containing 2Fe(NO3)3+ FeSO4) with solution B (containing NaOH+ 2%Dextran) to create nanostructured media with a biocompatible dextrancoating and a Fe3O4 core. Magnetite produced at flow rate of 0.04 mL /sshowed uniform particle size distribution with average size 10nm and saturation magnetization (Ms)up to 60emu/g.TheX-ray diffraction pattern indicates pure phase of Fe3O4 as-synthesized nanoparticles with high crystallinity. ZeroField Cooled and Field Cooled measurements indicated a superparamagnetic nature of assynthesized particles with a low blocking temperature that varies by the amount of dextran introduced in the mixture. The specific power absorption value obtained of up to 130W/g shows that the magnetite–dextrannanostructured fluid appears to be a promising active media for the local magnetic hyperthermia for cancer therapy. The nanoparticles placed in a 2mL vial with a concentration of 5mg/mL containing Luria-Bertani (LB) medium that has approximately 2.0x108 cells. The vile is inserted into DM100 Series Magnetic Hyperthermia Device that provides an alternating magnetic field of 300gauss with a frequency of 604KHz. In this condition, the super paramagnetic nanoparticles were heated up to 60°C that incites a heat shock effect in the cells leading to destroy the E.coli bacteria.

APOE GENE ASSOCIATED WITH LIPID-RELATED TRAITS IN HISPANIC POPULATION

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Background: High levels of cholesterol have been demonstrated to cause heart disease and stroke. There is a significant research in cardiovascular disease, apolipoprotein E (APOE) gene and high cholesterol regarding non-Hispanics, but as of now there is limited research regarding APOE e4 allele associated with high levels of cholesterol in the Hispanic population. There are three types of alleles e2 being the protective allele against neurological diseases, e3 the most common type, and e4 known to be the high-risk allele for diseases. This research aims to study the correlation between APOE e4 allele and phenotypes that demonstrate a high risk for elevated levels of cholesterol in Hispanic population to be able to be educated and prevent. **Methods:** Data was collected from both the Texas Alzheimer's Research and Care Consortium (TARCC) (N=1,320) and the Initial Study of Longevity and Dementia from the Rio Grande Valley (ISLD-RGV) (N=62) with a total of 1,382 participants. Questionnaires that included demographics, medical history, and blood/saliva samples were collected. The Statistical Package for Social Sciences (SPSS) version 26 was used to identify if the APOE e4 allele was associated with several cholesterol related phenotypes in the subjects. **Results:** Results demonstrated a statistically significant association between APOE e4 allele and high levels of cholesterol in the Hispanic population. **Conclusion:** The findings of this research will help us with early diagnosis and interventions for patients with a risk for high cholesterol related diseases such as cardiovascular disease.

LIGAND-BASED VIRTUAL SCREENING OF SULFONAMIDE ANALOGUES FOR THE DISCOVERY OF NEW CARBONIC ANHYDRASE II/IX INHIBITORS FOR CANCER THERAPY

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Background: Carbonic anhydrase (CA) II and IX are overexpressed in numerous tumors associated with the hypoxic phenotype and have been involved in poor prognosis and cancer progression, which characterizes them as an attractive therapeutic target. The purpose of this study was to identify sulfonamide analogues as CA inhibitors based on affinity and interactions of molecular docking. **Methods**: Through structure and similarity-based virtual screening and applying filters involving a preselection based on functional group, Lipinski's rule of five, mutagenic and tumorigenic characteristics, the best candidates were docked into the isoenzymes. Known reference ligands were used to determine affinity regions favorable for protein-ligand interactions. The best scored sulfonamide derivatives with Tanimoto coefficient ≥ 0.7 were chosen for key interactions analysis. Finally, 10available compounds for CA-II and8 for CA-IX were selected for further investigation. **Results**: Molecular docking into the protein binding pocket with 18 compounds for CA II/IX resulted in moderate to high binding affinity compared with reference ligands, but all of them higher than standard inhibitor acetazolamide. Key interactions with His94, His96, His119coordinatesion Zn+2in the active site, beside crucial H-bond with Thr199and Thr200 for CA-II and Gln92 and Thr200 for CA-IX. **Conclusions**: Selected compounds might be potential CA inhibitors based on good binding affinity and key interactions in the active site of crystallized structure after molecular docking.

TC-PTP OVEREXPRESSION ATTENUATES SKIN CANCER FORMATION DURING ENVIRONMENTAL SKIN CARCINOGENESIS.

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Background: T-cell protein tyrosine phosphatase (TC-PTP), encoded by Ptpn2, has been shown to function as a tumor suppressor during skin carcinogenesis. **Methods:** we generated a novel epidermal specific TC-PTP-overexpressing (K5HA.Ptpn2) mouse model to show that TC-PTP contributes to the attenuation of chemically induced skin carcinogenesis through the synergistic regulation of STAT1, STAT3, STAT5, and PI3K/AKT signaling. **Results:** We found overexpression of TC-PTP increased epidermal sensitivity to DMBA-induced apoptosis and it decreased TPA-mediated hyperproliferation, coinciding with reduced epidermal thickness. Inhibition of STAT1, STAT3, STAT5 or AKT reversed the effects of TC-PTP overexpression on epidermal survival and proliferation. Mice overexpressing TC-PTP in the epidermis developed significantly reduced numbers of tumors during skin carcinogenesis and presented a prolonged latency of tumor initiation. Examination of human papilloma and squamous cell carcinomas (SCCs) revealed that TC-PTP expression was significantly reduced and TC-PTP expression was inversely correlated with the increased grade of SCCs. **Conclusion:** Our findings demonstrate that TC-PTP is a potential therapeutic target for the prevention of human skin cancer given that it is a major negative regulator of oncogenic signaling.

TARGETING RNA POLYMERASE I SUPPRESSES GROWTH OF PANCREATIC CANCER

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Abstract:
Background: Dysregulation of ribosome biogenesis was observed in various cancer types including pancreatic cancer (PanCa).Therefore, strategically targeting ribosome biogenesis could be a novel approach for pancreatic cancer treatment. One such approach is to targe tribosome biogenesis is via small molecule inhibitors of RNA Polymerase Ias these inhibitors have shown promising anti-cancer activity. In this study, we for the first time, evaluated the therapeutic effect of a novel RNA polymerase I inhibitor (BMH-21) against PanCa. **Methods and Results:** We observed differential constitutive expression of RPA-194 in human PanCa cells when compared with normal HPDE cells. BMH-21 significantly inhibited expression of RPA194 in PanCa cells as determined by WB and confocal microscopy analysis. BMH-21 induced the apoptosis and inhibited growth of various PanCa cells as determined by MTT assay and flow cytometry. BMH-21 treatment inhibited colony formation potential and metastatic phenotypes of various PanCa cells as examined by colony formation and atomic force microscopy analyses.BMH-21 significantly ($P<0.01$) downregulates the phosphorylation of AKT (Ser473) and WNK-1 (Thr60) kinases and Stat3 phosphorylation at Ser727 and upregulates pChk2 kinase in PanCa cells.BMH-21(2 mg/kg i.p) inhibited pancreatic tumor growth in an orthotopic xenograft mouse model. Excised tumor tissues of BMH-21 treated mice showed decrease expression of RPA194 and ki67as compared to vehicle treated group. **Conclusion:** Our results suggest that BMH-21 is a novel drug for targeting ribosome biogenesis and could be used for the treatment of pancreatic cancer.

TARGETED INDUCTION OF RESPIRATORY IMMUNITY PROVIDES PROTECTION AGAINST SECONDARY LUNG METASTASIS.

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ABSTRACT: Despite medical advances in the diagnosis and treatment of cancer, metastatic cancers remain a leading cause of death in the U.S. Increasingly, novel immune-based treatments which harness the patient's immune system has been shown to have promise for improving cancer survivorship. Such therapies take advantage of the immune system's natural defense mechanisms to halt the formation and progression of cancer. This is mainly through the early activation of innate immune cells such as natural killer cells and the subsequent activation of the adaptive immune responses such as T and B lymphocytes which elicits a tumor-specific cytolytic and humoral antibody response, respectively. Researchers have taken advantage of these immune mechanisms of tumor defense as a complementary approach to current radio-chemo treatments, which have shown to be limited by adverse off-target effects on patients. This is particularly problematic for recurrent highly metastatic lung, brain, and bone disease, where the physiological function is a premium. Ongoing research in our laboratory is focused on developing immune-based vaccines to target local immune protection against metastatic lung disease. The expectation is that boosting immune responses at the metastatic site before seeding tumors from primary organs would mitigate metastasis and reduce mortality risks. Using an experimental murine breast cancer model of metastasis, we sought to examine the effect of intranasal vaccination to induce local and systemic adaptive immune responses as a first step in conceptualizing an immune-based vaccine. We hypothesized that an intranasal vaccine protocol would increase antigen-specific adaptive and humoral antibody responses across the respiratory tract. Our results demonstrated that intranasal vaccination provides protection against secondary lung metastasis using murine model of experimental lung metastasis. This protection was due to increased accumulation of both CD4+ and CD8+ T cells in the lungs that produced IFN- gamma as shown by flow cytometry and ELISA techniques. Again, our results show that intranasal vaccination produces higher tumor-specific IgG responses across respiratory tissues than no differences in tumor-specific IgG antibody production detected in the serum. These results provide initial findings suggesting the potential for targeted tumor vaccines to produce a local tumor-specific T-cell and antibody response with the potential to prevent tumor metastasis. Future challenge studies using spontaneous model of lung metastasis will test our working hypothesis that intranasal tumor vaccination protects the lung from tumor development in the presence of a primary breast tumor.

Medical Student Category

ARRHYTHMOGENIC RIGHT VENTRICULAR CARDIOMYOPATHY: IS COXSACKIE THE CRIMINAL?

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Introduction: Arrhythmogenic right ventricular cardiomyopathy (ARVC) is an inherited cardiomyopathy characterized by right ventricular dysfunction, which can precipitate sudden cardiac death in young adults**. Case Presentation:** A 22-year-old Hispanic male with PMH of hypertriglyceridemia and exertional syncopal episodes was brought to the ED after experiencing a sudden cardiac arrest while on the treadmill. On arrival, patient was intubated and placed on a defibrillator which detected Vfib with torsade de pointes. On arrival to ED, initial ECG revealed 1-2 mm ST depressions in leads II, III and aVF and incomplete RBBB. Chest XR showed water-bottle shaped cardiac silhouette. Coronary angiography demonstrated patent coronary arteries. Subsequently 2D echo was performed which showed severe enlargement of RV with EF of 30-35%and RV free wall akinesis. The only pertinent positives were Coxsackie A and B antibodies with titers as high as 1:1600 in Coxsackie A Ab. The patient met the 2010 Task Force Criteria for ARVC including 1 major criteria by 2D echo and 2 major criteria by ECG. The first major criteria met was regional RV akinesia and increased RV dimensions in end-diastole of PLAX RVOT >32mm and/or PSAX RVOT >36mm. The second major criteria met was inverted T-waves in V1, V2 and V3 in the absence of complete RBBB. Lastly, the third major criteria met, was presence of VT of left bundle branch morphology with superior axis. **Conclusion:** This case highlights the uncertainty behind the pathogenesis of ARVC and the role that cardiotropic viruses such as Coxsackie plays in the pathophysiology of this disease.

BARRIERS TO APPLYING GUIDELINES FOR TREATMENT OF TYPE 2 DIABETES MELLITUS IN THE RIO GRANDE VALLEY

Carra G Honderich

BACKGROUND: Type 2 Diabetes mellitus affects 29.6% of adults in the Rio Grande Valley and 54% are estimated to be uncontrolled. Established and new pharmacotherapy agents are available, and guidelines exist in individualization of glycemic targets and agent selection. We present a case facing various barriers in applying these guidelines. **CASE PRESENTATION**: A 54-year-old uninsured woman with past medical history of uncontrolled type 2 diabetes mellitus, hypertension, chronic kidney disease stage 3, peripheral artery disease and bilateral below knee amputations presents for follow-up. She denies polyuria, polydipsia and weight changes. She reports compliance with medications and a fasting glucose range of 180-195. Current diabetes medications are insulin glargine, lispro, and dapagliflozin-metformin. Prior intolerance to dulaglutide with gastrointestinal upset. On exam, she had had a recent amputation with signs of infection. Data showed A1C this month at 9.4% from 13.7% 3 months ago and 14.8% 1 year ago. GFR stable at 58 and electrolytes normal. Urine protein creatinine ratio elevated at 1,865. Determined A1C goal to be below 8.0% based on multiple factors and reviewed benefits and risks of pharmacotherapy options. We increased the glargine and dapagliflozin-metformin. **CONCLUSION:** Though patient has a relatively young age, multiple factors suggest we have a less stringent target such as 8% including established vascular complications, limited resources as patient is uninsured, and patient self-care capabilities including health literacy. We will review the benefits, risks, and challenges in using sodium-glucose-cotransporter inhibitors and glucagon-like-peptide agonists and how the evidence applies to our patient.

BACTRIM, SPIRONOLACTONE AND LISINOPRIL. STAY AWAY! A DANGEROUS COCKTAIL FOR HYPERKALEMIA.

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Introduction: Hyperkalemia is a potentially life-threatening complication of several medications, particularly in clinical situations of polypharmacy. Trimethoprim/sulfamethoxazole (TMP-SMX) is a first line antibiotic for initial empiric therapy of uncomplicated urinary tract infections and for outpatient treatment of MRSA for skin and soft tissue infections, however trimethoprim (TMP) can enhance the hyperkalemic effects of spironolactone and Angiotensin receptor inhibitors (ACEI). We present a case of a 53-year-old female who presented to the Hospital with severe muscle weakness and ECG changes after coadministration spironolactone and TMP-SMX and lisinopril**. Case Presentation**: A 53-year-old female with history of HTN, CKD stage 3B, CHF, hypercholesterolemia and DM II, chronic left foot ulcer presented to our local hospital with generalized malaise, severe lower extremity weakness and heaviness of 2 days duration. She normally uses a walker but over the last 2days had noticed increasing difficulty standing from a seated position. Her medications included: spironolactone, carvedilol, lisinopril, amlodipine, aspirin, atorvastatin, and insulin and had been started on TMP-SMX for the management of a chronic ulcer with suspected right lower extremity cellulitis. On admission, her vital signs showed a blood pressure of 182/87 mm Hg, with normal pulse and body temperature, and a BMI of 52kg/m2. Physical exam revealed a morbidly obese female who appeared lethargic with dry oral mucous membranes. She had RRR, with 2+ pulses in all extremities. Her lungs were clear to auscultation bilaterally with non-labored breath sounds. Her musculoskeletal examination revealed normal ROM in all extremities with no deformities. On neurological examination, she was AOx3 with no focal neurological deficits observed. The laboratory results revealed hemoglobin of 9.7 g/dL and a hematocrit of 32.2%; significantly elevated potassium levels at 8.6 mmol/L; GFR of 31, creatinine: 1.79 mg/dL; cardiac studies showed normal troponin with elevated proBNP of 1502 pg/ml. EKG revealed tall, peaked T-waves with widened QRS complexes in the precordial leads and a right BBB. Due to concern for medication induced hyperkalemia, TMP-SMX, spironolactone and lisinopril were discontinued. The patient was started on a continuous infusion of normal saline, calcium gluconate, insulin, albuterol and given kayexalate for management of hyperkalemia. On consultation with the nephrologist, dialysis was not advised. The patient improved rapidly over the next 3 days without complications with resolution of the ECG changes, improved muscle strength and a resolved potassium level by the time of discharge. **Conclusion:** More than 20 million prescriptions of TMP-SMX are written annually and the likelihood of concomitant prescription is high, clinicians and pharmacists should be aware of the enhanced hyperkalemic effects of TMP-SMX, spironolactone and lisinopril and should avoid this combination. In one study patients taking spironolactone and TMP-SMX increased the odds of sudden deathand should be of special concern for patients with other risks factors for hyperkalemia including advanced age, chronic renal disease and use of other drugs which can also cause hyperkalemia a was the case for our patient.

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A CASE OF CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY AFTER PFIZER COVID-19 VACCINATION

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Background: Chronic inflammatory demyelinating polyneuropathy is an immune-mediated polyneuropathy characterized by peripheral demyelination, resulting in symmetrical sensory loss and distal and proximal muscle weakness. While CIDP

has been reported after influenza, tetanus, and other common vaccinations, this is the first reported case of CIDP after COVID-19 vaccination to our knowledge. **Case Presentation:** A 34-year-old right-handed male with an unremarkable past medical history presented with bilateral distal paresthesias, proximal and distal muscle weakness, and fine motor difficulties. Symptoms initially manifested with toe numbness, approximately two weeks after receiving the first dose of the Pfizer COVID-19 vaccine. Paresthesias gradually progressed from lower extremities to upper extremities. Two months after the initial COVID-19 vaccine, symptoms worsen with decreased muscle strength, difficulties with fine motor activities, difficulties climbing stairs, and lifting objects above his head. Neurologic evaluation revealed 4/5 strength in upper and lower extremities, generalized hyporeflexia, decreased vibration, and proprioception. MRI of the brain and spine revealed no abnormalities. Nerve conduction studies were consistent with demyelination and cerebral spinal fluid analysis revealed albumin cytologic dissociation. The patient was diagnosed with CIDP and began steroids after poor response toa four-day treatment course of IVIG 2g/kg which resulted in partial improvement of strength. The patient continues to follow up with long-term prednisone therapy. **Conclusion:** Demyelinating polyneuropathies are a rare complication of vaccination. While the benefits outweigh the risks of immunization, we aim to inform of this potential complication.

CHARACTERIZATION OF ORAL CAVITY AND OROPHARYNGEAL CANCER IN THE TEXAS RIO GRANDE VALLEY

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Background: Cancers of the oral cavity(OC)and oropharynx(OP)account for 3% of cancers diagnosed in the United States each year. A primary cause of death among the Hispanic population in the United States is cancer, accounting for 20% of annual mortality. The Rio Grande Valley (RGV) is a medically-underserved area of South Texas with a large Hispanic population facing health disparities. In this study, we examine the incidence and mortality of OC and OP cancer in the RGV. **Methods:** CDC population-level incidence and mortality rate per 100,000of OC/OP cancer among patients in the RGV counties of Hidalgo and Cameron County between 2014-2018compared to Texas and national incidence data was used. **Results:** Age-adjusted incidence and 95% confidence interval of OC/OP cancer in the RGV from 2014-2018 is 7.3 [6.6, 8.0], as compared to 11.2 [11.0, 11.3] in Texas, and 11.9 [11.8, 12.0] in the United States. Rates of OC/OP cancer among RGV Hispanics was 6.7 [6.0, 7.5] as compared to 6.8 [6.5, 7.1] in Texas and 6.9 [6.8, 7.0] nationally. Mortality rate in these cancers in the RGV is 1.8 [1.5, 2.2] compared to 2.5 [2.4, 2.5] in Texas. **Conclusion:** OC/OP cancer rates are prevalent in the Rio Grande Valley but there may be an under-reporting of data. Of note, cancer cases could not be separated by subsite (OC vs. OP) due to the method of reporting to the database. The rising rates nationally may pose a larger problem to the RGV due to cancer health disparities and inequities.

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MALIGNANT COLORECTAL CANCER IN THE RIO GRANDE VALLEY: A DEMOGRAPHICAL STUDY

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Background: There is abundant demographical data available that provides an excellent general statistical overview of colorectal cancer (CRC) within the Hispanic population in South Texas. Much is known about the overarching trends regarding incidence, prevalence, mortality and screening rates among this specific population as compared to other racial

and ethnic groups at the state and national levels. Despite our understanding of these broad trends, few studies have taken a step inward to provide a closer demographical analysis of a CRC population here in the Rio Grande Valley. In this study, we narrow the scope and take a closer look at this population to better understand its demographical composition and to identify potential disparities specific to this region that may be overlooked by broader studies. **Methods:** A retrospective medical chart review was performed on 96 patients with a primary diagnosis of malignant colorectal cancer who received care at the UTHealth RGV Surgery & Women's Specialty Center in Harlingen, Texas between January 1st, 2020 and February 5th, 2021. Data regarding age, gender, race/ethnicity, insurance status, screening usage, comorbid conditions, follow-up rates, cancer stage, tumor location and treatment outcomes were collected. **Results& Conclusion:** Results for this study are pending due to initial delays in the IRB review process. Data is currently being collected and results will be submitted before the July 27th deadline.

THE LARGE NECROTIC PULMONARY MASS: A CASE OF SQUAMOUS CELL CARCINOMA OF THE LUNG

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Lung cancer is the most common cause of cancer-related mortality worldwide. Squamous cell lung carcinoma is a slow-growing type of non-small cell lung cancer that can spread to multiple sites throughout the body in advanced stages. Patient is a 62-year-old male, lifelong smoker with a history of TB, who presented to the ED with right-sided chest pain, radiating to his right arm that began 1 month prior. Patient also reported a dry cough, decreased appetite, and an unspecified amount of weight loss during this time. On physical exam, he was severely cachectic. CXR and follow up CT with contrast, revealed a large complex mass in the right upper lobe measuring 8.8 x 6.9 cm with a patchy dense consolidation adjacent to the mass, bilateral COPD, pulmonary fibrosis, a partially calcified right pleural plaque, and mediastinal lymph node enlargement. Subsequent biopsy revealed necrotic poorly differentiated squamous cell carcinoma which was found to be stage IIIB, locally advanced and inoperable. The patient was uninsured, without permanent housing and was unable to follow up with an oncologist. Combination chemoradiotherapy was arranged about 2 months after the initial visit at which point the tumor was found to be 14 x 9.5 cm. South Texas is home to the nation's largest population of uninsured persons, of which over 30% live below the federal poverty level. The case is a prime example of how complex social circumstances can pose significant barriers to accessing health care, resulting in an alarming rate of late-stage cancer diagnoses/deaths.

LEARNERS ENGAGING WITH HISPANIC COMMUNITIES TO ADDRESS COVID-19 INEQUITIES BY DEVELOPING A CULTURAL COMPETENCE GUIDE FOR PUBLIC HEALTH MESSAGING

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Introduction: The Rio Grande Valley (RGV)has the highest rates of obesity and diabetes nationwide which have compounded the impact of COVID-19.We propose addressing underlying mistrust and systemic racism through a resident-and-student-learner-led, community-engaged, educational public health campaign targeting the Hispanic community in the RGV. **Methods:** Twelve students were provided interdisciplinary leadership skills in a community-engaged public messaging campaign covering issues of COVID-19 inequities. Learners used these skills to engage with clinic community partners in qualitative interviews regarding the patient population to guide the creation of a culturally competent public health messaging rubric for the Hispanic community. **Results:** Pre-intervention survey results showed that the patient population was 97% Hispanic/Latino with a 73% language preference for Spanish and a 98% uninsured status. Clinic

leaders described 67% of their patient population as being high risk for COVID-19 with multiple underlying risk factors, including obesity, hypertension, and diabetes. Surveyed clinic leaders selected that PSAs need to have clarity of the message and availability in the patient's preferred language. Our team created two focused, culturally competent rubrics for the Hispanic community. **Discussion:** This research has shown that it is imperative to be able to evaluate which PSAs are effective in delivering their intended message as well as being able to monitor the effects on their target audience. The Hispanic and Spanish-speaking communities needs more effective public health messaging to decrease testing fears, improve contact tracing, motivate individuals to seek medical care, and to ultimately address the rampant COVID-19 inequities that exist.

Key Words: systemic racism, health inequities, COVID-19, public health messaging, Hispanic, Rio Grande Valley, interdisciplinary, culturally competent rubric

CHRONIC DVT IN THE SETTING OF A LONG-TERM IVC FILTER, PROTEIN C DEFICIENCY, AND NON-COMPLIANCE

Matthew Parvus

Abstract

Introduction: Inferior vena cava filters (IVC filter) are used to prevent pulmonary embolism in cases where antithrombotic therapy is contraindicated, led to a complication, or has failed. In most of these cases, a deep vein thrombosis (DVT) is already present, which can break of and flow to the lungs as an embolus. Inferior vena cava filters are often placed with the intention of removal and IVC filters area temporary intervention, so leaving them in long term can present with significant risk. Nevertheless, the risk of DVT is high, especially in patients with coagulopathies, such as protein C deficiency, a condition in which thrombogenesis becomes dysregulated and increases risk for clot formation. **Case:** This case presents a 35-year-old Hispanic woman who presented to the emergency department for a one-week history of pain and swelling of the right leg. She was seen earlier by her primary care physician a week prior who diagnosed a right lower extremity DVT on venous doppler study, but the pain and swelling worsened despite treatment with Lovenox (Enoxaparin) and Eliquis (Apixaban).Past medical history is notable for history of protein C deficiency, chronic DVT that was treated with an IVC filter (twelve-years ago), and venous insufficiency. Due to non-compliance, and financial difficulties, the patient didn't continue her treatment and her IVC filter was never removed. The patient's laboratory findings were PT 13.7 and INR 1.16. CT of the abdomen and pelvis showed that the IVC filter infiltrated past the walls of theIVC, which represented significant risk for removal. Catheter directed tPA (thrombolysis) was performed and during the procedure the thrombus was found to extend above the IVC filter, which resulted in the placement of a second, more proximal IVC filter. The patient was discharged to follow up on lifelong enoxaparin and pain management. She is still being followed as an outpatient, as her chronic DVT has not since resolved. **Discussion**: When to remove an IVC filter has been a popular topic, especially after the FDA's statement in 2010 siting that they should be removed as soon the risk of PE has decreased. This is especially true for retrievable IVC filters, such as the Bard G2 filter which was placed in our patient 12 years ago. The typical timeframe of removal for a retrievable filter is 2-3 weeks after starting anticoagulation, as risk of complications increases over time. One of the most common reasons that patients do not have their filter removed is that they are lost to follow up, as in this case. The patient noted that her current economic status, along with being incarcerated, kept her from following up and taking her anticoagulation medication appropriately. This case highlights the importance of removal of retrievable IVC filters, especially in patients with hypercoagulable conditions such as protein C deficiency. Also highlighted in this case is the imperative nature of patient compliance with anticoagulation medication in order to avoid complications such as IVC filter thrombus formation and chronic DVT.

By: Matthew Parvus

A CLOSER LOOK AT COVID TESTING AMONG THE PEDIATRIC POPULATION LIVING ALONG THE TEXAS-MEXICO BORDER

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Background & Objectives: On August 2020, the AAP reported that Texas only provides pediatric age distribution for 8% of COVID-19 testing results. In response to the limited data availability, our research focused on tracking test positivity rates for the pediatric population (ages 0-19) in the Rio Grande Valley from March 30 through August 7, 2020. **Methods & Analysis:** The research study received IRB exemption status on August 9, 2020. We obtained deidentified data from UTHealth RGV COVID testing sites in Hidalgo and Cameron county. SPSS was used to find the mean and median age and frequency over time of pediatric COVID-19 positive cases. **Results:** Mean age of the pediatric population was twelve years old with 50% of positive cases between 0-15 years old.

- Highest frequency of COVID-19 positive cases was found among 18-19yearsold.
- Each age exhibited more negative cases than positive except for 0 years old and 5 years old
- Pediatric cases in Hidalgo County were positive 37.9% of the time, 32.2% in Cameron County, and 27.3% in other counties (Starr, Willacy, etc.)
- The highest cases of COVID-19 within the pediatric population occurred between the months of July and August.

Our study found 36.3% of pediatrics patients tested positive vs. national average 3.6- 18.3%, and 11.0% of our total positive cases were pediatric patients vs. 9.1% nationally. **Conclusions:** At the local level, our data can help pediatricians target appropriate resources for COVID-19 impacted families. At the state level, the data can provide current trends and relevant information on pediatric COVID-19 testing throughout the state to help inform legislative decision making.

MOANS, PALPABLE GROIN, AND ENTRAPMENT OF BONE: A CASE OF MALIGNANT PERIPHERAL NERVE SHEATH TUMOR IN AN OTHERWISE HEALTHY HISPANIC MALE

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Background: Malignant peripheral nerve sheath tumors (MPNTs) are rare malignant soft tissue sarcomas that have an incidence of about 0.001%. MPNTs typically occur in individuals who have neurofibromatosis or secondary to radiation therapy and rarely occur sporadically [1,2] We present a case of a previously healthy 56-year-old gentleman who was diagnosed with MPNTs. **Case**: A healthy 56-year-old gentleman presented with worsening LLQ abdominal pain for 6 months. Associated symptoms included bloating, LLE swelling, early satiety for the past 2 months, and a 5-10lb unintentional weight loss. Patient denied recent cough, night sweats, dyspnea, fever, chills, melena or hematochezia. Vitals were WNL. Physical examination revealed a palpable mass on LLQ extending into the groin and edema of the left leg with diminished strength 3/5. CBC and CMP were unremarkable. CT abdomen showed a large necrotic mass in the left retroperitoneum infiltrating along the iliopsoas musculature, extending into the left hip and into the left side of L3, L4, L5 vertebral bodies and through L4 transverse process measuring up to 24.6 x 11.5 x 13 cm. Pathology revealed spindle cell sarcoma composed of moderately atypical, elongated spindle cells positive for vimentin, with loss of H3/K27me3, and negative for SMA, S-100 consistent with MPNSTs. **Conclusions:** The is a rare case of a sporadic presentation of MPNTs. Treatment depends on the extent of tumor burden and metastatic disease is typically treated with chemotherapy. CT chest showed innumerable pulmonary nodules. Patient is currently being treated with Doxorubicin and Ifosfamide with minimal response.

ACUTE EXACERBATION OF HEART FAILURE IN A 35-YEAR-OLD HISPANIC FEMALE WITH PREMATURE CORONARY ARTERY DISEASE STATUS POST CABG X 4 AND MULTIPLE COMORBIDITIES: A CASE REPORT

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Background: Coronary artery disease (CAD) is the leading cause of death in adults worldwide.1Although CHD prevalence is highest in adults of middle age and above, it is important to be aware of risk factors in young adults that predispose them to premature CAD and its complications. We present a case of a young Hispanic female with acute exacerbation of heart failure (HF), CAD, and multiple comorbidities. **Case**: A 35-year-old Hispanic female with past medical history of CAD status post coronary artery bypass graft (CABG) X 4, HF with reduced ejection fraction (EF) of 40-45%, chronic kidney disease stage 4, type 2 diabetes mellitus, and hypertension presented with shortness of breath for one day. No other associated symptoms. Vitals revealed she was tachycardic (110s) and hypertensive (160s/90s). Physical exam revealed decreased breath sounds. Echocardiogram revealed an EF of 20-25%. The patient was successfully managed with furosemide, isosorbide dinitrate, hydralazine, and fluid restriction. **Conclusions**: This is a rare case of premature CAD with multiple complications (CABG X4) in a young female. Approximately 3% of all CAD cases occur in patients less than 40 years old.2 This prevalence is likely underreported due to young patients exhibiting less symptoms. Risk factors for CAD in young adults, such as smoking, diabetes, hypercholesterolemia, and obesity,2should be considered when assessing for CAD in populations with a high prevalence of comorbidities such as the Rio Grande Valley, Tx. Careful observation for these factors can lead to prevention of CAD and its complications.

PEDIATRIC COVID-19 ENCEPHALITIS

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Background: Neurologic complications of COVID-19 in the pediatric population have been reported in a limited number of reports. There have been reports of COVID-19-associated encephalitis in pediatric cases along with neuroimaging findings revealing involvement of some parts of the nervous system. We present the first case of pediatric severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) -associated encephalitis targeting the parietal lobes. **Case**: A 14-year-old morbidly obese Hispanic male with no past medical history presented to the hospital for new onset seizures. Family reported exposure to his COVID-19 positive mother, a one-week history of fever, and a three-month history of decreased oral intake, vomiting, diarrhea, weight loss, and decreased urine output. He tested positive for SARS CoV-2 six days prior to admission. Patient was admitted to the intensive care unit. Blood pressure was 169/101. Labs included elevated blood urea nitrogen and creatinine, 102mg/dL and 26 mg/dL, respectively, consistent with severe kidney injury. Brain MRI revealed restricted diffusion on the bilateral subcortical white matter of the parietal lobes. Electroencephalogram revealed mild to moderate encephalopathy. After treatment with convalescent plasma and dexamethasone there was complete neuroradiologic abnormality resolution with dramatic clinical improvement. **Conclusions**: This case highlights a new brain target of the SARS-CoV-2 in pediatric patients. The temporal improvement in symptoms after administration of convalescent plasma and dexamethasone raises interest in their use for management of SARS-COV-2 infection in pediatric patients. Further research into these findings is important for predominately Hispanic communities which have been disproportionately affected by the pandemic.

DOSIMETRIC AND VOLUMETRIC ANALYSIS IN ENDOBRONCHIAL BRACHYTHERAPY TREATMENT OF CARCINOMA LUNG PATIENTS: A PILOT STUDY

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Background: To analyze the radiation doses received by Organ at Risk (OAR) nearby the target volume and volumetric changes in the target volume in carcinoma lung patients irradiated in three treatment session of endobronchial brachytherapy (EBBT). **Methods**: Dosimetric analysis was conducted on patients of carcinoma Lung received three session of Endobronchial brachytherapy treatment in High Dose Rate brachytherapy unit with Ir-192 source. A flexible Lumen care catheter was inserted into the bronchus and positioned catheter tip at the tumor. Length of the implanted catheter was measured with the source position simulator device. Acquired three dimensional CT image data set with x-ray marker was sent to TPS to generate an optimized treatment plan. The OAR's and target volume were delineated for the accurate assessment of doses in each brachytherapy treatment session. The prescribed dose was normalization at 1.0cm from the center of the catheter. Doses to OAR's and target volume were noted down from the DVH and detailed dose volume table from TPS. The prescribed dose was 7Gy per fraction in three fractions. Doses to OAR's and Target volumes were also evaluated for each treatment session of the patient. The change in the volume of the target irradiated was noted down from the dose volume table in TPS. **Results**: Thirty sessions were evaluated in this study as these were infrequent procedures to perform. Average mean dose to Esophagus was varied from 1.18Grey to 0.85Grey, average maximum dose to Heart was varied from 4.77Grey to 3.69Grey and average maximum dose to left coronary artery was varied from 0.44Grey to 0.91Grey. Average changes in the volume of a Target volume was found in varied from 20.45cc to 13.70cc in each treatment session and found there is signification volume reduction in the target volume irradiated. **Conclusion**: This study showed that the doses to OARs are significantly increased in second and third session of EBBT and the doses to OAR's were in their tolerance limit. There is a significant volume reduction in volume of the target in second and third treatment EBBT session. It implies that the EBBT is much effective in the treatment of lung carcinoma patients having disease lesion in primary and secondary bronchus. **Keywords**: Endobronchial brachytherapy, Oncentra Master Plan Treatment Planning System, Organ at Risk, Target Volume, Fraction, dose-volume-histogram

THE RARE OFTEN VIOLET SARCOMA: A CASE OF KAPOSI SARCOMA IN HIV/AIDS

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Kaposi sarcoma (KS) is a rare malignancy derived from the cells that line lymph and blood vessels. KS is caused by the human herpes virus-8 (HHV-8) and is an AIDS defining illness that manifests as violaceous skin and mucosal lesions.

The patient is a 37-year-old previously healthy male who presented with a 4-month history of rapid, unintentional weight loss totaling 60lbs. The patient reported having a low WBC count at a free health fair 1 year prior but was uninsured, without access to follow up care. Additionally, he noted the appearance of several dark purple, raised lesions on his skin about 9 months prior. Initial workup in the ED revealed elevated monocytes, and a dangerously low WBC count of 1.4 (ref 4.5-11x109). He was found to be HIV+ with a CD4 T cell count of 2 (ref:359-1519) The patient was subsequentially hospitalized where his labs continued to downtrend. Neutropenic precautions were placed to limit contact and while treatment was initiated. A biopsy of the skin lesions later revealed a diagnosis of Kaposi sarcoma.

South Texas is home to the nation's largest uninsured population of which over 30% live below the federal poverty level. Texas also ranks 7thin the country for new diagnoses of HIV. These social circumstances pose significant barriers to health care, resulting in an increasing rate of late-stage HIV/AIDS diagnoses/deaths. While there is no vaccine against the HHV-8, proper education and increased testing would ultimately carry the largest impact in the reduction of Kaposi sarcoma cases.

THE DYSPHAGIA CAUSING CANCER: A CASE OF OROPHARYNGEAL SQUAMOUS CELL CARCINOMA

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Oropharyngeal squamous cell carcinomas (OPSCC) occur in approximately 123,000 cases of oropharyngeal cancer diagnosis worldwide and with about 79,000 deaths yearly. OPSCC stems from the soft palate, pharyngeal wall, tonsils, vallecula, and base of the tongue. Patients with metastatic head and neck squamous cell cancer have a generally poor prognosis noting a median survival of 6 to 15 months. Treatment with systemic therapy is used for most patients and is dependent on their clinical factors, comorbidities, previous treatments, and pathologic features.

The patient is a 52-year-old male with a past medical history of liver cirrhosis, hepatitis C, and neurofibromatosis type 1 who was admitted for a 4-month history of dysphagia with unintentional weight loss of 50 pounds, severe neck pain, and worsening cough. Patient was found to have an obstructive supraglottic tumor. He underwent an emergent tracheostomy due to airway obstruction, and PEG tube placement due to oropharyngeal dysphagia/malnutrition. Tumor biopsy revealed invasive moderately differentiated squamous cell carcinoma of the tongue base and larynx, followed by oncology diagnosis of Stage IV SCC. The patient was affected by multiple social determinants of health as he was uninsured, did not have transportation, and lacked access to a PCP.

While late-diagnosed Oropharyngeal carcinomas carry a poor prognosis, early-stage tumors can be effectively treated with radiation or surgery. The unique population of South Texas often faces detrimental social circumstances from being uninsured, increasing poverty, and language differences. These factors often cultivate significant barriers to accessing health care thus, resulting in late-stage disease diagnoses.

EXPANDING HEALTH PROFESSIONAL EDUCATION IN THE RIO GRANDE VALLEY DURING THE COVID-19 PANDEMIC

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Abstract:
Purpose – The COVID-19 Pandemic prompted innovation in health professional education, such that learners are able to recognize and mitigate healthcare disparities in the outcomes of vulnerable populations. The primary objective of our project was to increase education on preventing, preparing for, and responding to COVID-19 and other locally prevalent infectious diseases that disproportionately affect RGV communities. **Description** – This project had 3 goals: (1) provide learners with virtual patient-interaction simulations (2) provide interactive training modules on the identification, prevention, and treatment of infectious diseases affecting South TX and strategies to increase child vaccinations, and (3) provide learners an opportunity to coordinate community health promotion via PPE and COVID-19 information distribution. **Partners** – Collaborative stakeholders included sponsoring bodies - the 3 regional AHECs, the AHEC Scholars Program, and the Department of Pediatrics at UTRGV SOM. The commercial companies, Mursion and Nearpod, were consulted regarding use of their technologies to advance Goals 1 & 2. UT Health RGV patients and RGV colonia populations were the rationale for completion of Goal 3 and the project as a whole, as we sought to aid in improving their overall health. **Looking Ahead** – Our approach integrated content learning and practice with regard to identifying, preventing, and addressing regionally prevalent infectious/non-infectious diseases and sensitive health topics affecting all age groups. The multifaceted nature of the project helped to solidify the knowledge gleaned and revealed possible avenues for health professional curriculum that can further learning in areas that are difficult to address in a traditional standardized manner, from pediatric patient encounters to community health interventions.

PROACTIVELY PREVENTING MEDICAL ERRORS: A STUDENT-LED APPROACH TO PATIENT SAFETY IN PRE-CLINICAL CURRICULUM

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Endometriosis is a gynecological condition characterized by chronic pelvic pain. The brain periaqueductal gray (PAG) is one of the key structures that modulates pain signaling. While the dorsal PAG is involved with coping mechanisms related to nociception and processing of anxiety and fear, the ventral PAG has been implicated with immobility and depressor responses. Previous work from our laboratory has shown a shift in mu opioid receptors (MORs) within the PAG in the rat model of endometriosis. Here, we aim to map the immunohistochemical localization of MORs and the opioid peptide beta-endorphin in the brain of rats with endometriosis. We also measured whether exposure to environmental enrichment (EE) modifies MORs and beta-endorphin localization. The autotransplantation rat model of endometriosis was used in all animals. Sprague Dawley female rats were exposed for 8 weeks to EE (larger enclosure, increased social interaction and novelty) or normal housing conditions (NE) prior and during the progression of endometriosis. After 60 days of endometriosis, the brains were collected and examined for MOR and beta endorphin immunoreactivity. The dorsal PAG of rats with endometriosis (n=4) exposed to EE expressed a 3.7% increase in MORs immunoreactivity compared to the NE group (n=4). The percent area occupied by MORs ir in the dorsal PAG of EE group compared to the NE group was also increased by 2.8%. Within the ventral PAG, an 11.7% decrease in MORs ir was observed in the EE group vs. NE group. Qualitative analysis of beta-endorphin in dorsal PAG showed positive immunolabeling in the EE group vs. the NE group. No changes in beta-endorphin were observed in the ventral and lateral PAG. Results suggest that non-pharmacological interventions such as EE can directly affect the expression and localization of MORs within the PAG, which we postulate could lead to changes in nociceptive perception.

PROACTIVELY PREVENTING MEDICAL ERRORS: A STUDENT-LED APPROACH TO PATIENT SAFETY IN PRE-CLINICAL CURRICULUM

Authors: Sahar Panjwani, Daniel Nwosuocha, Nelson Gonzalez, Ayleen Godreau, MD

Introduction: Preventable medical errors are currently the third leading cause of death in the United States following heart disease and cancer(1). This study was designed to assess the change in knowledge from earlier education of medical students during pre-clinical years. **Methods:** Patient safety trainings have been conducted for two years for interested first and second-year medical students and responses are assessed through a pre-test, immediate post-test, 3-month post-test, and 6-month post-test. The survey assesses student knowledge on aspects of patient safety and has Likert scale questions assessing if the training influenced students' desire to learn about patient safety. **Results**: From the original data from the first training, improvements were seen in students considering themselves to be well-versed in different aspects of patient safety in the 3-month post-test (33.3%; p-value=1.00) compared to the pre-test training (11.8%). The percent of students that agreed they plan to incorporate patient safety techniques into their future practice improved from83% in the 3-month post-test to100% in the 6-month post-test. Data gathering is ongoing for the second group that participated in the training. **Conclusion**: The improvement in students who considered themselves to be knowledgeable about patient safety 3 months after the training is promising, despite the results of the 6-month post-test, as it highlights the need for long-term training and can be further assessed using data from the second training. The lack of statistically significant findings can most likely be attributed to small sample size and will likely improve with further data collection.
1. Makary, M. A., & Daniel, M. (2016). Medical error—the third leading cause of death in the US.Bmj,353, i2139.

IATROGENIC THYROTOXICOSIS DUE TO COMPOUNDING ERROR OF LIOTHYRONINE

Stephanie Onyechi, MD Candidate 2022; Dr. Maxwell Falkoff, MD

Background: This case is one of four recorded reports of thyrotoxicosis due to compounding error of liothyronine. The presentation of this differs from classic thyrotoxicosis caused by endogenous hormones. Compounding pharmacy regulation has been a source of regulatory conflict for decades. **Case Presentation**: A 70-year-old woman was brought to the emergency department by her daughter for concerns of a 2 days of altered mental status. She had a past medical history of Hashimoto's thyroiditis and hypertension. Physical exam was notable for elevated blood pressure, which was around the patients' baseline. Sinus tachycardia was also noted. The patient had recently had a change to her thyroid medication, though could not provide more information regarding this. Workup in the emergency department revealed Free T3 levels elevated out of range at >22.80 pg/mL. Upon further investigation, the patient was found to be taking liothyronine from a compounding pharmacy. An independent analysis of the medication concluded that the patient was administered a dose of liothyronine that was 1000-times greater than prescribed by her endocrinologist. **Conclusions**: This case presentation highlights an unusual presentation of thyrotoxicosis, particularly as associated with liothyronine overdose. In this report we will outline the previously recorded reports of iatrogenic thyrotoxicosis due to compounding pharmacy error. We will discuss the inherent risk associated with use of compound pharmacies and detail other instances of adverse events traced to compound pharmacy error.

INTERNAL MEDICINE QUALITY IMPROVEMENT PROJECT

Stephanie Onyechi, Maria Alvarenga, and Elif Duran

Background: In the midst of the Coronavirus pandemic, clinical experiences required adaptation to ensure safety of student learners. One such change was that the internal medicine clerkship moved to a fully inpatient experience. An unintended consequences of this was the elimination of protected weekends from the 2-month course. This research study aimed at evaluating student's perceptions of the clerkship's schedule and how it related to well-being, burnout, overall satisfaction with the clerkship, and final grades. **Methods**: An anonymous survey regarding overall satisfaction with self-study time, ability to master clerkship requirements was emailed to students who had completed the IM clerkship by April 26, 2021. Our intervention was the addition of three academic golden weekends to the schedule of the IM clerkship for any student completing the clerkship after April 26. Students in the post-intervention clerkship will submit an identical survey and the responses will be compared. In addition to this, focus groups will be asked about their perception of how 3 full 2-day weekends affected their experience. **Results**: Preliminary data from the pre-intervention population identified burn-out and dissatisfaction with lack of a 2-day weekends as barriers to satisfaction. A focus group with the first post-intervention clerkship group identified golden weekends as a useful intervention. There was an emphasis on the increased ability to master the clerkship material and study for shelf examination. Formal analysis pending.

THERAPEUTIC INTERVENTION USING AUTOLOGOUS EXOSOMES FOR TREATMENT OF EARLY-STAGE PANCREATIC CANCER

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Background: Pancreatic cancer (PanCa) is the third deadliest cancer in United States with a poor survival rate. Despite extensive research efforts, there is not any substantial progress in cancer therapeutics; major challenges lie with

inherent drug toxicity, ineffectiveness, and resistance due to impediments against intracellular drug delivery. From a therapeutic delivery standpoint, novel delivery vehicles are required that are both biocompatible and non-immunogenic for a patient in order to maximize the chances of cure. This is possible by utilizing an autologous biological material, which can be applied as a personalized medicine to match the individual circumstances and molecular profile of the patient. One such approach has been optimized in our lab, which utilizes exosomes from the matched tumor adjacent normal(NAT)area following surgical resection. Using exosomes as a scaffold, our objective is to deliver therapeutics safely and effectively to the patient tumor site. **Results**: NAT derived exosomes showed effective size and zeta potential (size: 44.12 ± 0.89; Zeta potential: -14.9 mV), which is ideal for drug delivery purposes. The purification of exosomes was confirmed using proteins isolated from exosomes through Western blotting for expression of exosomal markers, such as CD63 expression. Immunofluorescence for CD63 expression confirmed the efficient delivery of exosomes in PanCa cells. Our results indicated high drug loading capacity of NAT derived exosomes as demonstrated using drug, Ormeloxifene (ORM)though UPLC. Exo-ORM treatment efficiently delivered ORM into the cancer cells and inhibited the cancer cell characteristics, such as, proliferation compared with ORM alone. Additionally, NAT derived exosomes showed enhanced expression of tumor suppressor microRNA, miR-145, suggestive of their therapeutic importance. We observed restoration of lost miR-145 levels in PanCa cells on incubation with NAT derived exosomes for 48hrs.This further indicates their relevance for their utilization in the development of an anti-cancer therapy. **Conclusion**: Our observations offer importance of the utilization of NAT derived exosomes for personalized medicine as a therapeutic delivery vehicle in PanCa.

A CASE OF ADULT ONSET STILL'S DISEASE

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Introduction: Adult Onset Still's disease is a rare inflammatory disease affecting approximately 4 people in 1 million. It is a multi system disease with a common presentation of high fevers, skin rashes, arthritis, and elevated ferritin. Current research states that the cause is unknown but genetic factors may predispose patients to this disease. If left undiagnosed and untreated, it leads to long term and irreversible joint damage along with organ damage. **Description**: A 48 year old woman presented to the clinic with complaints of migratory arthritis, generalized malaise, fever, sore throat, generalized pink non itchy rash, and flu like symptoms that have been ongoing for over six weeks. The patient reported that prior to the onset of her symptoms, she had been moving furniture from a wooded area and may have possibly been bitten by a "bug." In addition to these complaints, the patient had an ongoing history of comorbidities including obesity, and chronic generalized pain categorized as possible fibromyalgia. This patient met the classic presentation of a patient with lyme disease. Along with standard labs, an ELISA & Western blot test to detect antibodies to Borrelia Burgodorferi was ordered and the patient was started on a 14 day course of doxycycline while awaiting results. The patient's results came back negative. The patient returned to the clinic two weeks later with persistent and worsened symptoms. A battery of tests were ordered to now rule out possible causes of this patient's presentation including antinuclear antibodies, rheumatoid factor, STI testing, and special attention was paid to CBC, CMP, liver function tests, and inflammatory markers. Everything came out negative with the exception of an elevated ESR, an elevated C-reactive protein, an increased WBC, decreased RBC's, increased ferritin, and elevated liver enzymes. This clinical picture was extremely puzzling given the negatives. The patient's case was revisited from the beginning. Careful consideration was made to the timeline of the fever, rash, joint pain, sore throat, past medical history, physical, and lab results. The diagnosis of Still's disease was reached. This was a diagnosis of exclusion after careful analysis and ruling out. **Conclusion**: Adult Onset Still's disease is considered a rare disease according to the NIH. It begs the question, "Is this a rare disease because it is an immatator of other well known autoimmune conditions thereby going underdiagnosed?" From this patient's presentation, it was very easy to dismiss this as a myriad of other things. However, careful and thorough examination was undertaken in order to reach this diagnosis of exclusion. The current FDA treatment for this condition is Iliaris, a human anti-IL-1β monoclonal antibody which neutralizes 1β signaling, resulting in suppression of inflammation in patients with disorders of autoimmune origin.

CONFUSING CODE STATUS IN AN 81-YEAR-OLD SPANISH-SPEAKING WOMAN:

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Background: End-of-life discussions present a challenge for many Hispanic families and physicians. Hesitancy to begin discussions and a language barrier hinder elderly Spanish-speaking patients and their families from making informed decisions about end-of-life care. We present a case of a confusing code status in an elderly Spanish-speaking woman with a rapidly declining condition. **Case presentation**: An 81-year-old Hispanic Spanish-speaking female with a past medical history of hypertension, chronic kidney disease stage 3 and type 2 diabetes mellitus presents with generalized weakness, decreased appetite and a 10-pound weight loss over one month. She wished to be Do-Not-Intubate. Throughout her stay, she was diagnosed with pyelonephritis, acute renal failure requiring dialysis, atrial fibrillation and care was escalated to the ICU. Family discussions led to a change in code status to full code on Hospital Day (HD) 7. Her WBC trended up to 51,000 and she was diagnosed with diffuse large B-cell lymphoma on HD8. Palliative care was consulted on HD11. On HD14, the patient experienced respiratory distress and was intubated. She continued to deteriorate and on HD 16 the family decided to withdraw care and she died. **Conclusion**: Latino patients, like ours, are less likely to have advanced directives and more likely to receive aggressive interventions in their final days. Barriers include lack of professional interpreter usage and limited health literacy. Our patient case exemplifies that in the chaos of an emergent situation and in the absence of appropriate end-of-life planning, Spanish-speaking patients may receive aggressive care conflicting with their initial wishes.

OPTIMIZATION OF A NON-INVASIVE TEMPORARY DEAFFERENTATION PROTOCOL TO IMPROVE UPPER EXTREMITY REHABILITATION

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Background: After a spinal cord injury neural structures that survive reorganize. The brain "ignores" past associations with weaker muscles below the level of injury so stronger, spared muscles take over cortical maps of weaker muscles. Temporary Deafferentation(TD)is a method that utilizes short-term anesthesia, such as over-the-counter lidocaine cream ,to inactivate sensation pathways from stronger muscles so that the brain releases inhibition that was placed on weaker muscles, thereby strengthening them. There has been research supporting TD approaches to rehabilitation; however, there is not an established protocol to apply TD in a clinical setting. Here, we seek to optimize a protocol to deploy TD using over-the-counter lidocaine cream. **Methods**: We will utilize Ebanel 5% lidocaine cream to anesthetize the biceps muscle on healthy participants. Sensation, using monofilaments, will be measured before placing the cream and then every 10 minutes after the cream has been placed, up to one hour in duration. We will evaluate how long it takes to achieve TD and how long TD lasts after application of the lidocaine cream. **Results**: Results will show when a patient no longer feels sensation on their biceps muscle and later when they regain sensation, thus helping establish a timeline as to when a participant has the best window of opportunity to exercise and thus strengthen a weaker muscle, such as the triceps. **Conclusions**: By establishing a clearer timeframe for a TD approach, this mode of rehabilitation can be adapted to more varied clinical settings, in addition to non-medical settings.

THE PAIN RELATED PRAYERS (PPRAYERS) QUESTIONNAIRE: A PRELIMINARY PRINCIPAL COMPONENT FACTOR ANALYSIS

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BACKGROUND: Different coping strategies (e.g. catastrophizing, coping self-statements and prayer) have differential impacts on pain outcomes. Currently there is only one measure of prayer as a coping mechanism for pain, the Prayer/ Hope subscale of the Coping Strategies Questionnaire-Revised (CSQ-R). CSQ-R is an incomplete representation of prayer practices and offers a narrow measure of prayer. It measures prayer in a passive nature neglecting other styles of prayer. There is a need for a more comprehensive measure of prayer related to pain. The aim of this study is to develop and validate a robust measure of the use of prayer amongst persons with chronic pain; the Pain related PRAYERS (PPRAYERS) questionnaire. **METHODS**: Interim data analysis was performed on 42 participants who use prayer to cope with pain. Participants completed a questionnaire battery including the Brief Pain Inventory, PPRAYERS, Duke University Religion Index (DUREL), Coping Strategies Questionnaire-Revised (CSQ-R) and Pain Catastrophizing Scale (PCS). **RESULTS**: A three-factor principal component analysis was performed and accounted for 58% variance (i.e. three types of prayer: active, passive and neutral); minimal variance accounted for by three other atheoretical factors. **CONCLUSION**: The PPRAYERS measure is comprised of three distinct factors: active, passive, and neutral prayer and is associated with pain and other pain-related factors. The creation of PPRAYERS lays the foundation for additional studies evaluating the benefit of active, passive and neutral prayer in the treatment of chronic pain especially in patients open to religious, spiritual or meditative-based coping strategies.

Arterial Stiffness and White Matter Hyperintensities in Patients with Amnestic Mild Cognitive Impairment

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Background: Mild cognitive impairment, or MCI, is the stage before severe dementia in which one experiences cognitive and memory problems. For this study, amnestic MCI (aMCI) patients are examined because this group have memory problems that usually progress to Alzheimer's Disease. It is possible to identify factors that prevent or slow down the progression of the dementia at this stage. Arterial stiffness is related to increased arterial pressure which may lead to the presence of white matter hyperintensities (WMH). This study investigated the relation between the atrial stiffness and white matter hyperintensities volume in aMCI patients. **Methods**: An inclusion criterion was established for a health control group and an aMCI group that include an age range between the age of 55-80 years with no preexisting cardiovascular condition. Arterial stiffness and the β-stiffness index are assessed at the common carotid artery measuring the carotid arterial pressure and carotid arterial wall intima-media thickness (IMT) using ultrasound and applanation tonometry. All groups obtained WMH measurements using T2/FLAIR MRI. **Results**: No significant difference was found between the two groups when comparing β-stiffness and WMH. When controlling for age, BMI, and sex, carotid stiffness was significantly greater in aMCI groups (MCI: $p=0.007$). Greater WMH volume correlated with increased carotid systolic pressure and greater pulse pressure correlates (MCI: $r= 0.40$, $r= 0.39$, all $p<0.001$). In addition, greater WMH volume correlated with greater thickness and carotid stiffness (MCI: $r=0.38$ $r=0.39$, all $p=0.001$). **Conclusion**: It suggests that arterial stiffness may plays a role in WMH as a risk factor for dementia.

Resident Category

UNUSUAL INFLAMMATORY PRESENTATION FOR LOCALLY ADVANCED PAPILLARY THYROID CARCINOMA

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Background: Thyroid cancer usually presents as a thyroid nodule. If the history implies rapid growth of the nodule, new onset hoarseness or presence of ipsilateral cervical lymphadenopathy then it should raise concern for malignancy. Deep neck infection/inflammation has rarely been reported as initial presentation and these patients are potentially misdiagnosed. **Case Presentation**: We present a 56-year-oldmale who comes to clinic for evaluation of left neck nodule. He started two weeks prior with sudden neck swelling associated with erythema and pain in his lower neck that caused choking sensation and swallowing discomfort, he was prescribed Bactrim and prednisone with improvement of symptoms. Ultrasound done in office showed a six-centimeter heterogeneous mass on his left thyroid with multiple lymph nodes on left neck, largest being 3cm at Level IV which was biopsied with FNA and confirmed metastatic papillary thyroid carcinoma. A total thyroidectomy with central lymph node dissection and modified left neck dissection was performed, pathology reported left 5.2 cm papillary thyroid carcinoma with areas of infarction, 21/38 lymph nodes positive for metastases with extra nodal extension in largest LN pT3aN1b. He was referred to endocrinologist for radioactive iodine therapy. **Conclusions**: Papillary thyroid cancer is the most common thyroid malignancy, and it tends to metastasize to cervical lymph nodes. It's very rare to have patients present with deep neck infection/inflammation and it should be suspected to avoid delayed management.

IMPROVING INTERNAL MEDICINE RESIDENTS' SELF PERCEIVED CONFIDENCE, KNOWLEDGE AND PROCEDURAL SKILL PERFORMING PAP SMEARS

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Background: Cervical cancer is the second most common cancer in women worldwide; early detection plays a key role in reducing morbidity and mortality. In Texas' counties lining the border, cervical cancer death rate is 30% higher than the rest of the state. **Methods**: A total of 20 Internal medicine residents from the UTRGV - DHR were randomized to an intervention and control groups. Before the intervention, residents had not received any formal training skills on Pap smear technique during their residency. The educational intervention consisted of an eleven-minute video on Thin prep specimen collection and a single-day hands-on training skills Pap smear workshop using a life-size gynecological manikin. An electronic survey was sent one month later to the study participants. The post-survey consisted of a 5-point Likert scale with closed ended questions about perceived confidence and knowledge on cervical cancer screening. **Results**: A total of 20 unique survey responses were recorded (overall response rate 39%). Results didn't show statistically significant difference between the intervention group (n=10) and the control group (n=10) regarding self-perceived confidence to perform a Pap smear, knowledge about the indications and proper technique and steps to perform a pap smear. **Conclusion**: Our interventions were not enough to increase self-perceived confidence, knowledge and procedural skills when performing pap smears. We strongly believe that additional interventions that help overcome the main limitations perceived by the IM residents will be able to increase cervical cancer screening.

COLON CANCER PRESENTING WITH DEEP VENOUS THROMBOSIS (DVT) IN A HISPANIC WOMAN

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Introduction: Incidence of colon cancer in young adults with no family history has significantly increased, leading to reevaluation of screening age. Colon cancer presents in various forms, but this case report discusses DVT as an initial presentation. **Case report:** A 46-year-old Hispanic woman with history of chronic anemia secondary to dysfunctional uterine bleeding, recently on oral contraception was evaluated outpatient for complaints of neck swelling after recent COVID vaccination. CT angiogram of the neck demonstrated a left internal jugular vein thrombus. The DVT was attributed to concomitant use of COVID vaccine in a patient on OCPs. The patient started oral anticoagulation and was discharged home. Within four days, the patient presented to the hospital after 3-dayduration of hematochezia. She was hemodynamically stable with laboratory values significant for hemoglobin/hematocrit 7.8/27.7 respectively and prothrombin time/INR 12.8/1.1 respectively. Digital rectal exam negative for hemorrhoids or fissures. Gastroenterology was consulted and colonoscopy revealed an infiltrative obstructive large mass in the rectosigmoid colon. Biopsy and pathological evaluation confirmed colonic adenocarcinoma. Heme-oncology was consulted, and patient was evaluated for outpatient management. **Conclusion**: Current guidelines suggest colorectal cancer screening in people between ages 45 and 49 to reduce incidence of advanced adenoma. There have been approximately 8 cases in colon cancer initially presenting with DVT. To the best of our knowledge, this is the only case reported in a Hispanic woman.

FECAL MICROBIOTA TRANSPLANT IN A PATIENT WITH MULTI-DRUG RESISTANT CLOSTRIDIUM DIFFICILE (MDR C.DIFF)

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Introduction: Studies have shown MDR C. diff is the most common bacterial cause of diarrhea in resource rich settings. One of the most feared outcome of MDR C. diff infection is pseudomembranous colitis. Multiple studies indicate FMT is the most effective yet underutilized in treating recurrent C. diff. **Case report:** A 73 year old man presented with complaints of diarrhea and fever of 3 days duration. The diarrhea was watery, voluminous, and up to 10 times per day with associated abdominal discomfort. Patient was hospitalized twice in the last 2 months for similar complaints which were treated with oral antibiotics. On physical examination: Temperature 99.5 B/P 161/86 HR 114 and RR 20. Abdominal distention, mild tenderness and hyperactive bowel sounds. Cardiac and chest exams were unremarkable. Laboratory were significant for hypokalemia, elevated BUN and creatinine, lactic acidosis and leukocytosis. C.diff enzyme immune assay was positive for C.diff antigen and C.diff toxins A+B. Upon admission to the floor, IV fluid and electrolyte replacement began. A 10 day antibiotics regimen showed no clinical improvement. The patient's son donated stool, and two rounds of FMT were administered via colonoscopy; improving patient's clinical condition. Resolving leukocytosis and electrolyte abnormalities. **Conclusion**: FMT is strongly suggested in patients with MDR C. diff as it decreases fatal complications and hospital readmission.

MY ACHY-BREAKY HEART: A CASE OF DIFFUSE LARGE B-CELL LYMPHOMA PRESENTING AS IMPENDING CARDIAC TAMPONADE IN A HISPANIC WOMAN

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Background: Mediastinal masses can arise from typical structures within the mediastinal or they can develop secondary to metastasis from other organ systems[1]Primary mediastinal diffuse large B-Cell lymphomas(PMBCL)are uncommon, accounting for 7%of the cases of diffuse large b cell lymphoma. We describe a case of a 35-year-old woman who presented with atypical chest pain and shortness of breath and was diagnosed with PMBCL in the setting of impending cardiac

tamponade. **Case Report:** A 35-year-oldwoman with history of cutaneous lupus presented with an8-month history of chest pain with associated worsening shortness of breath. Upon further questioning, the patient reported having night sweats intermittently with an associated10-lb weight loss. On examination, patient was tachycardic to 140 BPM, dyspneic with SPO2 99% on room air, with a BP of137/87mm/Hg. **Results**: CXR was performed which showed a widened mediastinum and cardiomegaly. LDH 514 IU/L. Echocardiogram was performed which revealed a large mediastinal tumor, pericardial effusion with suspicion of possible diastolic compromise. Patient was taken to OR for an emergent pericardial window and biopsy of the mass. Pathology along with immunostaining positive for CD45, CD20, Bcl1, Bcl6correlatedwith a diagnosis of PMBCL. **Conclusions**: PMBCL can be aggressive but tend to have similar response rates compared toother types of b cell lymphomas when combination chemotherapy and mediastinum irradiation is initiated [3]. Our patient opted to be transferred to MD Anderson for higher level of care. Patient is scheduled to follow-up with the oncology team soon.

DIFFERENTIAL GENE EXPRESSION BETWEEN AFRICAN AMERICAN AND CAUCASIAN AMERICAN PROSTATE CANCER

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Background: African-American (AA) men have higher incidence and mortality from prostate cancer compared to Caucasian-American (CA) men. Increasing evidence suggests that genetic and molecular alterations play important roles. We identified a 5 gene panel viz. p-Akt (Ser473), chemokine (C-X-C motif) receptor 4 (CXCR4), fatty acid synthase (FASN), interleukin-6 (IL-6) and matrix metallopeptidase 9 (MMP-9) highly expressed in prostate cancer and analyzed their expression in AA and CA cohorts. **Methods**: IHC of p-Akt, CXCR4, FASN, IL-6 and MMP-9 were evaluated in RRP specimens (n=20) from each ethnic group exhibiting Gleason scores ranging from 6through 9. **Results**: Low to medium staining for p-Akt and weak focal staining for MMP-9 was observed in the cytoplasm of tumor cells (10-20%)in <20%specimens in both groups; whereas moderate to strong cytoplasmic expression of FASN was noted in >80% of tumor cells in both groups. Expression of IL-6 varied from weak to moderate intensity between (20-100%tumor cells)in 85% cases in CA- and 75% in AA-specimens. A marked difference in CXCR4 expression was noted between AA-and CA-cancer specimens. Weak CXCR4 staining was noted <5% of CA-specimens; whereas >85% of AA-prostate cancer exhibited weak to strong CXCR4 expression in between 10-100% of tumor cells localized in membrane, cytoplasm and nucleus in high-grade tumors. **Conclusions**: CXCR4 expression appears to be distinctly different in prostate cancers from AA and CA men. Further studies are needed to assess whether this distinction correlates with prognosis between racial groups.
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IT'S NOT ALWAYS CELLULITIS: AN UNUSUAL PRESENTATION OF LEUKOCYTOCLASTIC VASCULITIS

Dina Hammand

Background: Leukocytoclasticvasculitis (LCV) is a histopathologic term for isolated cutaneous small vessel vasculitis (CSVV) without systemic involvement. LCV can be idiopathic or caused by medications, infections, vascular disorders or malignancies. The annual incidence of biopsy-proven leukocytoclastic vasculitis is approximately 45/million individuals. It presents as erythematous macules with palpable purpura bilaterally on dependent areas of the body. Unilateral and localized presentations are uncommon. Here, we present a rare case of isolated LCV on the abdomen. **Case Presentation**: A 65 year old woman with a history of vitiligo and Raynaud's Syndrome, presented with a 12 day history of a tender abdominal rash associated with fevers at home, but no other systemic symptoms. The patient was started on multiple antibiotics in the outpatient setting without any improvement. The rash continued to expand and darken prompting her

ED visit. On evaluation, vital signs were unremarkable. Abdominal inspection was significant for a large violaceous, palpable rash over the lower abdomen which was tender and warm to touch. Labs showed leukocytosis of 16K, sedimentation rate 104, ANA titer 1:80 but ANCA, antiphospholipid antibodies, HIV/Hepatitis serology, blood cultures, Ds-DNA, and RF were negative. Skin punch biopsy was performed from the right lower abdomen which was consistent with leukocytoclastic vasculitis and thrombotic vasculopathy with ischemic epidermal necrosis. Immunofluorescent studies were negative. **Conclusions**: Our case represents a rare presentation of LCV, localized in a non-dependent area. LCV should not be missed, as it can clinically mimic cellulitis, but would require a different management.

A CASE OF MINOCA IN A PATIENT WITH RECENT HISTORY OF COVID-19 INFECTION.

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Background: Myocardial infarction with nonobstructive coronary arteries (MINOCA) is a syndrome of myocardial ischemia resulting from microvascular dysfunction and with < 50% stenosis of major epicardial vessel. Incidence of MINOCA is 6% among patients with acute myocardial infarction. We present a case of MINOCA in a patient with a recent history of COVID-19 infection. **Case presentation:** A 22-year-old man with recent history of Covid 19 infection presented with 3 days history of typical cardiac chest pain. He was not taking any medications or illicit drugs. EKG revealed sinus rhythm with ST elevations in leads II, V5, V6. Troponin I was elevated to 5.3ng/ml. He underwent coronary angiography which was reported as normal with no signs of obstructive coronary artery disease. Further workup including viral panel, ESR, CRP, HIV, hepatitis panel were negative. He was discharged on clopidogrel, metoprolol and rosuvastatin. His clinical course was significant for recurrence of similar symptoms 2 months later, with EKG revealing similar pattern as prior. Cardiac CT was negative for pericardial thickening or any other cardiac abnormalities. He was started on aspirin and colchicine for suspected post-Covid myopericarditis, resulting in resolution of his symptoms. **Conclusion**: Diagnosis of MINOCA should include recognizing underlying mechanism as it would help in the management. Common reversible etiologies of MINOCA are microvascular dysfunction, spasm and thrombophilia disorders. Interestingly, COVID-19 infection has been recognized as a thrombophilic state. While the management of overt coronary artery disease is well established, the benefits of reperfusion strategies and cardioprotective therapies in MINOCA require further investigation.

INCIDENTAL CHRONIC LV THROMBUS; A DREADED COMPLICATION OF ANTERIOR MI

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Background: Left ventricular thrombus may develop after acute myocardial infarction and occurs most often with a large STEMI. The use of reperfusion therapy and fibrinolytics has dramatically reduced the incidence. Epidemiologic data suggest the incidence of LV thrombus is as high as 25% in patients with anterior MI. Risk of embolization has been reported up to 15% in patients without anticoagulation. **Case presentation:** 70 y/o man with history of coronary artery disease with remote LAD stent placed over 17 years ago presents to the office as a new patient for evaluation of exertional shortness of breath and chest pain. Upon review of patient's history an echocardiogram and nuclear stress test where ordered. 2D echocardiogram showed impaired systolic dysfunction with EF of 35%, hypokinetic left anterior wall, and akinesis of apical anterior wall. A 2 x 3 cm regular with echodense borders left apical thrombus was identified with no protrusion nor mobility. Stress test showed nonreversible apical ischemia. Left heart catheterization was performed showing patent LAD stent with only mild CAD present. Due to chronicity without complications and echocardiographic characteristics along with patient discussion the decision was made not to initiate anticoagulation at this point. **Conclusion:** LV thrombus is a complication of anterior and apical MI that increases the risk for MACE and stroke. Guidelines recommend oral anticoagulation of at least 3 months upon diagnosis but there is no clear recommendation for chronic stable cases. Echocardiographic characteristics can help guide the decision for anticoagulation initiation until further protocols are developed.

OSTEOMYELITIS IN DIABETIC FOOT ULCER: A COMMON DREADED COMPLICATION OF DM

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Background: Group B ß-hemolytic streptococci is a rare offending agent in osteomyelitis with strong affinity for the diabetic foot. A high index of clinical suspicion, alongside radiological studies, should guide prompt diagnosis and treatment to avoid unfavorable complications. **Case Presentation:** A 42-year-old obese gentleman with history of hyperlipidemia, hypertension, peripheral artery disease, depression with alcohol abuse, and recently diagnosed type 2 diabetes mellitus and peripheral neuropathy presented to the emergency department with worsening left foot pain for 2 weeks with a nonhealing necrotic ulcer. Upon presentation, he was in no acute distress with insignificant initial labs except for blood glucose of 269 and HBA1c of 10.6. X-ray showed no obvious bone abnormalities with potential subcutaneous emphysema. Empiric treatment with IV Zosyn was initiated. MRI showed cortical changes of 5th metatarsal head compatible with early signs of osteomyelitis. Wound cultures of the necrotic ulcer consecutively grew predominantly group B streptococcus agalactiae. Podiatry was consulted and subsequently performed debridement with partial amputation of the left 5thfoot digit. **Discussion:** Prompt diagnosis and empiric antibiotic treatment are imperative in the effective management of osteomyelitis, especially in patients with significant comorbidities. Osteomyelitis caused by group B ß-hemolytic streptococci should be considered in any diabetic patient with foot lesions, even in the absence of systemic signs and symptoms, such as fever and bacteremia. Additionally, all patients diagnosed with type 2 Diabetes should be counseled in the prevention and care of foot lesions.

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IMPLEMENTATION OF A QUALITY IMPROVEMENT PROJECT FOR MEDICAL RECONCILIATION: OUTCOMES IN A PRIMARY CARE RESIDENCY CLINIC.

Maria Pesantez

Introduction: The U.S. Food and Drug Administration (FDA) receives more than 100,000 U.S. reports each year associated with a suspected medication error (1) and each year, in the United States alone, 7,000 to 9,000 people die as a result of a medication error. A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer (2). Medication reconciliation is "a process of creating the most accurate list possible of all medications a patient is taking –including drug name, dosage, frequency, and route –and comparing that list against the physician's admission, transfer, and/or discharge orders."(3) It is done to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions. Many organizations that have implemented medication reconciliation have demonstrated its effectiveness in decreasing patient harm and preventing adverse drug events. Studies have shown that training members of the healthcare team to take a complete medication history improves accuracy and patient safety (4). The Institute for Healthcare Improvement (IHI) stated that all institutions including primary care clinics were required to have a medication reconciliation process in place to ensure appropriate usage of medications (3). It is imperative that short and long-term care facilities establish safe practices for improving the accurate communication of medication reconciliations. **Aim**: The purpose of our quality improvement project is to increase resident, patient, and clinic staff awareness of medication reconciliation. We aimed to increase compliance of medication reconciliation from 62% in August 2020 to above 80% in December 2020. Our aim is also to maintain medication reconciliation above 80% from January 2021 to March 2021. **Methods:** Our QI project included 12 internal medicine residents which all had different tasks in our project to achieve our aim. In development of this QI project design, we saw room for improvement within multiple facets of our outpatient clinic including people, materials, environment, methods and equipment outlined in our cause and effect diagram (Figure 1). We found that residents were likely not aware or forgetful in performing their

medication reconciliation in respect to the category of people (Figure 1). Additionally, patients might not have been aware that they had to bring their medications to their visit. Our interventions to address these issues included sending text messages to residents reminding them to complete their patient's medication reconciliation and reminding patients to bring all of their medications to their appointment. We also found that there weren't any reminders to prompt residents to perform medication reconciliation in respect to the category of materials (Figure 2). We addressed this issue by posting flyers in our clinic as reminders for residents to complete medication reconciliation. We also found that residents have multiple tasks to complete before the patient leaves the clinic in respect to the category of environment (Figure 1). We added a checklist reminder directly on the patient's face sheet as a reminder to residents to place orders, referrals, visit level, return to clinic and to complete medication reconciliation before the patient left the clinic. Many people are involved in the process of medication reconciliation including medical staff, patients and residents as we noted in the category of methods (Figure 1). We addressed this issue by having verbal discussions and formal monthly meetings with the clinic staff to ensure that the medications were updated in the patients' charts. Lastly, we discovered that telemedicine sick visits prevented patients and residents from acknowledging their list of medications. We clarified with our 8 medical staff members that a medication reconciliation is performed via phone prior to the telemedicine encounter. Our interventions stated above were implemented in October 2020. Our clinic manager would share a monthly metric report for our clinic which included how many total patients were seen that month, the total number of completed and missed medication reconciliations. Our team created an excel spreadsheet with the names of all the 52 internal medicine residents who rotate every 5th week in the clinic. We then transferred the number of each missed med recs to the excel sheet for each resident. Medication reconciliation was considered complete if medication reconciliation was performed by the resident on the date of visit and prior to the patient leaving the clinic. Each month, our team would call or send a text with a personalized message to each resident with an update on their personal medication reconciliation progress. **Results**: Our clinic cohort observed the medication reconciliation done in our outpatient Internal Medicine clinic from the month of August 2020 to April 2021. Using the pre/post design, we quantified medication reconciliation compliance before and after our interventions to determine if there is a significant difference. We observed that prior to our interventions, our outpatient medication reconciliation was lower than 80%. In the month of August 2020 our percentage of medication reconciliation was 62%, improved slightly and gradually to 65% during the month of September 2020, then to 74% in October 2021. However, following the start of our intervention in November 2020, we observed a significant improvement in medication reconciliation. During the month of November 2020, the compliance increased 8%, from 74% to 82%. This trend continued, in the month of December 2020, medication reconciliation increased to 90%. However, we observed that in the month of January medication reconciliation decreased slightly to 88%, and in the month of February, March and April 2021, medication reconciliation plateaued in 87% and 85% respectively (Figure 2). **Discussion**: Overall our medication reconciliation has improved. We noted that there is a difference between residency classes. Residents in their first year performed medication reconciliation more frequently than residents in their second or third year. We propose that our education about medication reconciliation and making our residents aware that medication reconciliation was important, influencing the new residents in performing their medication reconciliation. This is in contrast to the senior residents who might have a habitual performance in not completing medication reconciliation since this was not taught to them initially, as well as burnout and click fatigue. Prior to our interventions, our medication reconciliation reports were sent to us by email which we assume that most residents do not pay attention to the multiple emails we receive and therefore were not motivating enough to increase our performance in medication reconciliation. There are some limitations to our project such as systematic errors that we found in the monthly reports that might not truly reflect the lack of medication reconciliation. Another limitation in our monthly report is that medication reconciliation performed before or after the date of service, were reported as partial medication reconciliation. Also, it is important to consider the feasibility of monitoring medication reconciliation performance on a regular basis, as it was noted during the completion of the QI project that it takes a significant amount of time and effort to contact residents regarding missing medication reconciliations. Our data does not reflect our residency as a whole since we noted a few residents who did not do their medication reconciliation during consecutive months and thus skewing the performance of others who did perform their medication reconciliation. The strength of our project included bringing awareness to our residency program about the importance of medication reconciliation. **Conclusion**: Our quality improvement project increased resident and

clinic staff awareness of medication reconciliation. We were able to maintain medication reconciliation above 80% from January 2021 to March 2021. In addition, we were able to identify possible barriers in the process that were not recognized before including issues related with equipment, workflow and environment. Moreover, our intervention allowed for accountability because residents were monthly informed about their own performance compared with the rest of resident physicians. This is especially important because our initiative allowed for development and self-improvement during training which, ultimately, might result in less medical errors. Drug-related errors are the leading cause of medical errors. Promoting a better transition of care through an accurate medical reconciliation is essential for patient safety.

QUALITY IMPROVEMENT PROJECT TO INCREASE HEPATITIS C VIRUS SCREENING FOR AMBULATORY GME INTERNAL MEDICINE CLINIC PATIENTS

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Background: In 2020, CDC established new guideline expanding Hepatitis C virus (HCV) screening to all adults aged 18 to 79 years. Our QI project objective is to enhance HCV screening amongst the UTRGV-DHR IM department by establishing suitable reminders and educational sessions. **Methods**: We reviewed HCV screening status of all adult patients 18 to 79 years old from June 1st2020 to December1st2020. We then provided one lecture on the new screening recommendation from CDC 2020 guideline. We also encouraged residents to educate patients on the importance of HCV screening, and to identify and overcome barriers against screening. We then measured HCV screening performed from March1st2021 to May 1st2021. The primary objective is to increase HCV screening in the ambulatory setting by 50%. **Results**: Among 843 patients from June 1st 2020 to December 1st2020, 219 patients were screened for HCV(26%). The results from March 1st2021 to May 1st2021 was 190 out 548 patients (35%). The difference was significant with p-value of 0.0005 using Chi-square statistical analysis. **Conclusions**: Even though we did not achieve our primary objective, HCV screening performance in our clinic had increased significantly from 26% to 35%. With this positive result, we will continue to enhance awareness among the residents by implementing didactic lectures to support evidence –based medicine practice about HCV screening. It is also important to identify the drawbacks of HCV screening including stress on patients and their family, future costs and side-effects of further testing and treatments.

BACTRIM INDUCED BRASH SYNDROME IN ELDERLY FEMALE: A CASE REPORT

Pooja Maknoor

Background: BRASH syndrome is a clinical entity comprising of bradycardia, renal failure, AV blockade, shock, and hyperkalemia. It is a vicious cycle in which AV nodal blockers and hyperkalemia act synergistically to precipitate bradycardia in patients with renal dysfunction resulting in cardiovascular collapse. **Case Presentation**: 89-year-old lady with history of Stage 4 CKD, hypertension, and diabetes mellitus presented with worsening generalized body weakness. On medication review, she was recently started on bactrim for treatment of afoot ulcer. Other home medications included diltiazem, lisinopril and dulaglutide. Initial vitals were significant for pulse 34, BP 90/35 mmHg and RR 19. Patient appeared somnolent but arousable. EKG was significant for third-degree heart block. Pertinent labs included potassium 6.7 and creatinine 5.8. She was treated with IV fluids and pressors for shock. She received calcium gluconate, insulin, dextrose and sodium polystyrene in the interim, until she was started on emergent dialysis. Following two sessions of dialysis, EKG reverted to sinus rhythm with resolution of complete heart block. She was eventually titrated off pressors. She was discharged on scheduled dialysis and follow up in a nephrology clinic. **Conclusion**: BRASH syndrome comprises of series of events that perpetuates itself. Caution should be exercised when prescribing bactrim as it might potentiate hyperkalemia, especially in patients with chronic kidney disease who are also on AV nodal blockers. Trimethoprim in Bactrim increases this risk by inhibiting potassium excretion from the kidneys. This could lead to a cycle of clinical events resulting in BRASH syndrome.

UNUSUAL CASE OF DISSEMINATED LANGERHANS CELL HISTIOCYTOSIS IN A YOUNG MALE, A CASE REPORT.

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Background: Langerhans cell histiocytosis (LCH), is an uncommon hematological disorder characterized by uncontrolled stimulation and proliferation of normal antigen presenting cells, Langerhans cells. It's estimated incidence in adults is approximately one to two cases per million. The purpose of this report is to describe the case of LCH in a 21-year-old male with multiple organ involvement including the brain, liver, bone; also, to discuss clinical, radiological, and histopathological features of LCH, and the role of internist in diagnosing and managing such disease. **Case presentation:** We describe the case of a 21-year-oldHispanic man with Langerhans cell histiocytosis involving his liver, skull, brain, and lungs. Initially patient presented to the hospital with upper GI bleeding. Upon review of his chart, it was found that the patient had previously a skull mass resection with immunohistochemistry confirming Langerhans cells which stain strongly positive for S100, CD 1a and langerin 3 year previous, and also a diagnosis of panhypopituitarism with a brain MRI with a 1 1.4 x 1.5 x 1.4 cm mass within the hypothalamus. Liver biopsy during current admission demonstrated a CD68 positive for histiocytes. **Conclusions**: This case report might contribute to a better understanding of the pathogenesis of LCH and will help to expand the knowledge of health professionals about this condition.

CHALLENGE OF DIAGNOSING AND TREATING A MEDIASTINAL MASS IN A YOUNG PATIENT

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Background: Germ cell tumors (GCT) are neoplasms arising in the testicles (1). Rarely these tumors can grow outside of the reproductive organs without involving them, acquiring the name of extragonadal GCT (2). Mediastinal extragonadal GCT are further divided into seminomatous, nonseminomatous (yolk sac tumor, choriocarcinoma and/or embryonal cell tumor), mature teratoma and immature teratoma according to the histological pattern (2). **Case Presentation:** 24-year-old-male patient presented to the ER with complaints of a persistent cough of one month duration accompanied by orthopnea, pleuritic chest pain, and worsening shortness of breath. Patient denied weight loss, testicular pain, night sweats, fever, or hemoptysis. Vital signs on admission were stable. CXR showed a large mass-like density overlying the right hilum. CT chest with contrast showed a13 cm anterior mediastinal mass with a right loculated pleural effusion. Biopsy was performed with immunohistology compatible with nonseminatomous germ cell tumor. Serological tumor markers including Alpha fetoprotein, LDH and Beta HCG were significantly elevated. AFP 1,680.4, LDH 399, Beta HCG 113 and CEA 1.3supported this diagnosis. **Conclusion**: Nonseminomatous extragonadal GCT are rare but aggressive neoplasm that arise in the anterior mediastinum. Statistically they occur more often in men than in women, commonly between the ages of 20 and 40 years old. Treatment with chemotherapy followed by surgical resection of the mass is recommended and should be initiated as soon as the diagnosis is made. Our patient opted to be transferred to MD Anderson Cancer Center for higher level of care.

A CASE OF METASTATIC LUNG ADENOCARCINOMA: A CALL FOR IMPORTANCE OF PREVENTIVE MEDICINE

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Tolosa-Hunt Syndrome is rare with an estimated annual incidence of one case per million per year. It's characterized by painful ophthalmoplegia caused by idiopathic granulomatous inflammation of the cavernous sinus. This syndrome was first described in 1954, with exquisite responsiveness to glucocorticoid treatment

Introduction: Lung cancer is the second most common cancer and the leading cause of death by cancer in both men and women in Unites States. There is an estimation of over 200 thousand new cases and over 100 thousand deaths due to lung cancer in 2021. **Case Presentation:** A 67-year-old male with a history of COPD and smoking presents with complaint of progressive cough and exertional shortness of breath. Chest x-ray demonstrated right sided pleural effusion which was exudative in nature upon pleural fluid analysis. Samples were sent for cytology however patient left against medical advice. Two months later, the patient, now undergoing chemotherapy for metastatic lung adenocarcinoma, was readmitted for management of SOB and right sided pleural effusion. During his extensive hospital course, patient received IV antibiotics for right sided empyema and subsequently underwent VATS of right lung with Talc pleurodesis and chest tube placement in right lung for further drainage. Subsequently patient was discharged home in hemodynamically stable condition. **Conclusion**: Early diagnosis and treatment can increase the survival rate and provide a better prognosis. USPSTF recommends cancer screening in adults aged 50 to 80 years with a 20-pack year smoking history, current smokers, and those quitted within the 15 years. However, due to lack of access to healthcare, lack of awareness and education, and insufficient practice of preventive medicine many qualified individuals do not get screened. A focus on lung cancer screening can decrease patients' physical, emotional, and financial burden and lessen the immense cost of lung cancer diagnosis and treatment for the healthcare system.

CERVICAL CANCER IN HISPANIC WOMEN

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Background: Cervical cancer is the fourth most common cancer in women and although the number of cases in the United States has decreased significantly, it is estimated that 14,480 new cases of invasive cervical cancer will be diagnosed in the United States in 2021. With the Hispanic population being the fastest growing demographic group in the United States, Hispanic women are 40% more likely to be diagnosed with cervical cancer and 20% more likely to die from cervical cancer. **Case Presentation:**29-year-oldHispanic female with history of cervical cancer status post hysterectomy and chemotherapy presents with complaints of vaginal bleeding for several months associated with fever, chills, generalized body aches and left flank pain. She has a left nephrostomy tube in place from left sided hydronephrosis. Urine cultures showed gram negative rods. She failed outpatient treatment with Cefdinir and was started on IV Zosyn. However, the patient left against medical advice and was advised to follow up with her oncologist and urologist. **Conclusion**: The USPSTF recommends screening for cervical cancer at the age of 21and routine vaccination at age 11. Due to disparities such as limited access to healthcare, lack of education, language barrier, many women do not get screened or do not return for follow up appointments after an abnormal result. Providing more access to cervical cancer screening and education about risk factors associated with cervical cancer as well as the importance of primary prevention are all ways to help women have a healthier lifestyle and improve quality of life.

RARE ATYPICAL PRESENTATION OF OGILVIE SYNDROME IN A HISPANIC MAN

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Background: Ogilvie syndrome (OS) also known as acute pseudo-obstruction of the colon is a bowel motility disorder characterized by features of intestinal obstruction in the absence of an anatomical or mechanical cause. Typical presentation is with abdominal distension but atypical and more rare presenting features have also been reported including respiratory distress. Thus, we present the first case of Ogilvie syndrome presenting with respiratory distress in a Hispanic man. **Case Presentation:** A 71-year-old gentleman with a history of diabetes mellitus, functional quadriplegia and other comorbidities was brought to the ED via EMS on account of altered metal status and constipation for about three

days. Pertinent findings from the examination showed a chronically ill looking gentleman with a GCS of 8/15, respiratory rate of 34, pulse oximeter saturating at 86% on ambient air, and the usage of accessory muscles. Abdominal examination showed a mildly distended abdomen with tympanitic percussion notes and hypoactive bowel sounds in all the quadrants. Digital rectal examination revealed soft non bloody loose brown stools. Three was global muscle wasting and reduced muscle strength. Blood gas showed a pH of 7.12, pCO2-117.4 and pO2-74 suggestive of severe hypoxic and hypercapnic respiratory acidosis. Plain KUB Xray and CT scan showed significant colonic distension with no fecal or anatomic obstruction. Patient was intubated for airway protection and abdominal distension was managed conservatively with discontinuation of enteral feeding, nasogastric tube decompression, potassium and magnesium replacement. Management can be escalated in patients who failed to respond to conservative measures or in those with complications like intestinal ischemia and perforation. in patients with colonic diameter > 12 cm who failed 48 to 72 hours (about 3 days) of conservative therapy, pharmacologic therapy with neostigmine can be used. **Conclusion**: Our patient responded to conservative measures including withholding of enteral feeding, nasogastric tube decompression, potassium and magnesium replacement. Management can be escalated in patients who failed to respond to conservative measures or in those with complications like intestinal ischemia and perforation. In patients with colonic diameter > 12 cm who failed 48 to 72 hours (about 3 days) of conservative therapy, pharmacologic therapy with neostigmine can be used.

Postdoctoral Researcher Category

FIRST REPORT OF THE PEPTIDE INHIBITORS OF CANCER CELL MIGRATION FROM MIEN1 PROTEIN SEQUENCE

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Background: MIEN1 is a tumor-specific protein that regulates migration and invasion of cancers. It is overexpressed in human breast, prostate, colorectal, ovarian cancers, making this protein a potential therapeutic target for these cancers. Our goal is to identify small inhibitory peptides (iPeps) derived from the MIEN1 protein. **Methods**: CASTp server was used to identify the pockets or empty concavities on the MIEN1 protein surface into which potential inhibitory molecules can gain access. The peptides were able to form hydrogen bonding with MIEN1 in chimera which is an indication of their MIEN1 binding. AntiCp server also indicated their anticancer activity. The peptides were synthesized and correct molecular mass was ascertained before doing biological methods. Screening methods included wound healing assay and transwell invasion assays. **Results**: Two out of the five designed peptides showed anti-migratory and anti-invasive properties against the triple-negative and highly metastatic MDA-MB-231 breast cancer cell lines. It can also inhibit metastasis hallmarks (e.g., migration and invasion) in breast cancer cells. **Conclusions**: We provide the first report of inhibitory molecules derived from the MIEN protein sequence. It can go a long way to inhibit cancer cell progression.
Acknowledgments: The work was supported by local funds.

BIOCIDAL PROPERTIES OF HYBRID NANONANOMATERIAL

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Background: Cancer is one of the essential unpredictable diseases worldwide; simultaneously, complicated issues created are by the human health system. Especially, breast cancer is the most commonly occurring cancer in women and is increasing remarkably in developing countries. It is a leading cause of cancer death in women, and breast cancer incidence rates are growing globally. To diagnose and treat cancer cells, different methods such as Radiation Therapy, Surgery, and Chemotherapy. These methods are high risk, more side effects, and high costs. Advanced healthcare material was developed to overcome this problem, inexpensive tools, and diagnosis of less-toxic drugs with negligible risk factors to normal cells. Nanoscience and nanotechnology fields can create higher prospects for diagnosing cancer cells using multifunctional nanomaterials for advanced clinical applications. **Methods**: Mutifuntional ZnO-TiO2-sodium alginate hybrid nanomaterial was prepared by a simple precipitation process. **Results**: ZnO-TiO2-Sodium alginate (ZTSAO) hybrid nanomaterial was successfully fabricated via a simple precipitation process. XRD patterns confirmed that the formation of ZTSAO crystal revealed a hexagonal wurtzite structure. The photoluminescence spectrum of ZTSAO, shows blue-green emissions at 480 nm and 484 nm, respectively, due to the active radicals generated in the nanomaterial, which are responsible for the associated anticancer activities. *In vitro* anticancer assay and the ZTSAO hybrid nanomaterial's toxicity effect were examined in cultured MDA-MB-237 breast cancer cells and L929 fibroblast cells. **Conclusions**: In summary, ZTSAO hybrid nanomaterial has been developed against breast cancer cells (MDA-MB-237), and an IC50 concentration value of 10 µg/mL was recorded when evaluated after 24 h. Furthermore, the toxicity of ZTSAO hybrid nanomaterial treated cells indicates that the cells are alive with viability of ~86.25 %, with results compared to the control group, showing that the ZTSAO hybrid nanomaterial exhibits minimum toxicity percentage. From this study, it is believed that ZTSAO hybrid nanomaterial is a highly promising nanomaterial, which will be suitable for advanced clinical applications.
Acknowledgments: The KC and KVP received support from the Fondecyt Postdoctoral Project No: 3190029 and Centro de Investigación de Polímeros Avanzados (CIPA),ANID/CONICYT Regional and GORE BIO-BIO R17A10003, Chile.

ANTI-PROLIFERATIVE AND APOPTOTIC EFFECTS OF BIOCHANIN A VIACELL CYCLE ARREST, ROS GENERATION AND UPREGULATION OF P53, BAX, PUMA AND NOXA IN HUMAN OVARIAN CARCINOMA PA-1 CELLS

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Abstract

Background: Biochanin A, an isoflavone that is mainly present in red clover, has potent chemopreventive properties against many cancers. Ovarian carcinoma is fifth most common and deadliest gynaecological malignancy that causes the highest mortality in females worldwide. Hence a substantial need for new therapies for combating this gynaecological malignancy arises. **Methods**: The present study aimed to investigate anti-cancerous potentials of biochanin A on cultured human ovarian carcinoma PA-1 cells through the cell viability assay, cellular apoptosis, disruption of mitochondrial membrane potential (MMP), involvement of ROS, cell cycle kinetics, and expression of apoptosis-related genes namely, p53, Bax, Bcl-2, Noxa and Puma. **Results:** The results of the experiments showed that Biochanin A significantly induces morphological alterations in PA-1 cells in a dose-dependent manner and thus inhibits cell to proliferate. Significant induction of apoptosis in PA-1 cells is evident by nuclear fragmentation, accumulation of ROS, loss of MMP, Annexin V positive cells and arrest of the cell cycle at G2/M phase. The up-regulated expression of apoptosis-related genes viz. p53, Bax, Noxa, Puma and down-regulation of Bcl-2 further signifies that biochanin A induces apoptosis in PA-1 cells **Conclusion:** Biochanin A exhibited potent anti-cancerous properties against human ovarian carcinoma PA-1 cells by checking the proliferation and by inducing programmed cell death via accumulating ROS, changing membrane potential and by following p53 mediated apoptotic pathway.

Keywords: Biochanin A, ovarian carcinoma, cell viability, MMP, ROS, nuclear fragmentation

EFFECT OF CHITOSAN AND HYDROXYPROPYL METHYLCELLULOSE ON SIZE AND ANTIBACTERIAL ACTIVITY OF COPPER NANOPARTICLES

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Research Abstract

Background: Nanomaterials exhibit better antibacterial activity because of their distinct structural/ morphological characteristics. Particle size and shape of the nanomaterials are the two significant parameters which affect the resultant antibacterial property. Different biopolymers have been explored to prepare capped metal nanoparticles with controlled/desired particle size and morphology. **Methods**: The present research work explains the effect of chitosan (CH) and hydroxypropyl methylcellulose (HPMC) on the shape and size of the copper nanoparticles (Cu NPs) and their antibacterial activity. The CH-Cu and HPMC-Cu NPs were achieved by facile precipitation technique using ascorbic acid as a nucleating agent. **Results**: Instrumental analysis by fourier transform infrared spectroscopy, x-ray diffraction, field emission scanning electron microscopy-energy dispersive x-ray analysis and transmission electron microscope confirmed the successful synthesis of Cu NPs. Scanning and transmission electron microscopic studies revealed that the formed NPs have a spherical structure with different diameters of ~8 ± 2 nm for CH-Cu and ~38 ±2 nm for HPMC-Cu NPs. Crystalline size calculated using Debye–Scherrer equation from XRD results were also in good agreement with the above results. The developed materials CH-Cu NPs and HPMC-Cu demonstrated excellent antibacterial activity against both gram-positive and gram-negative bacteria. It was observed that the CH-Cu NPs showed a higher inhibition zone when compared to that of the HPMC-Cu NPs. **Conclusions**: The biopolymer capped Cu NPs of smaller particle size exhibit much better antibacterial activity and the particle size of the Cu NPs (nm) can be finetuned with the aid of selecting the most appropriate biopolymer. **Keywords**: Chitosan, Hydroxypropyl methylcellulose, Copper nanoparticels,

IN VITRO EVALUATION OF PHTHALIMIDE DERIVATIVES AGAINST CANCER CELL LINES

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Lung, prostate, and liver cancers are among the most prevalent in men. Breast, cervical, and thyroid cancer are among the most prevalent in women (WHO, 2019). Cancer treatment usually includes chemotherapy and radiation therapy; however, available anticancer drugs have low selectivity and cause serious adverse effects, such as nephrotoxicity, neurotoxicity, and myelosuppression (Matsuo et al., 2010). Therefore, the design and development of compounds as new anticancer agents against the types of cancer with the highest incidence are of vital importance in the field of health. Phthalimide derivatives are promising compounds for the development of new anticancer agents (Li et al., 2011; Grigalius and Petrikaite, 2017; Kamal et al., 2002). Based on the above, this work aimed to evaluate the antiproliferative activity of 43 phthalimide derivatives against a main cancer cell line in men (HepG2) and two main cancer cell lines in women (HeLa and 4T1). Furthermore, the cytotoxicity of the compounds against a normal murine fibroblast cell line (3T3) was determined. The results showed that compounds C16, E11 and E16 presented the best antiproliferative activity against HeLa and 4T1 cell lines. Compound H16 alone decreased cell proliferation by 32% against the HepG2 cell line. Compounds H5, H16, E2, E16 and C1 did not affect the proliferation of the 3T3 cell line. Demonstrating that it would be important to continue with the analysis of this type of compounds against different cancers to find new compounds with better activity than those currently available on the market.

PRODUCTION OF CODON OPTIMIZED POLYOMAVIRUS SMALL T ANTIGEN IN ESCHERICHIA COLI.

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Expression of growth hormone (GH), prolactin (PRL), and placental lactogen (PL) and their respective receptors have been found in retinal cells and its main function has been postulated to confer neuroprotection and regulate blood vessels growth. Unbalance of these hormones has been described in some eye pathologies being diabetic retinopathy (DR) the most important one, because it's the leading cause of blindness in many parts of the world. In conditions with excess of GH, like; acromegaly, exogenous GH administration and pregnancy, DR has been found to have a more serious behavior which improves after GH levels return to normal. Also, higher levels of PL have been found in patients with a rapidly progressive DR. No study has aimed to analyze the influence that these hormones have on DR progression. This project aims to identify the potential pathogenic events that these hormones have on DR progression. The main objective of this study is to establish the effect of somatotropins in retinal endothelial cells (REC) viability and their effect on promoting the secretion of VEGF, IGF-1, and TGF-β by Müller cells, REC, and retinal pigment cells. For this purpose, we expanded and maintained the following cell lines: adult retinal pigment epithelial cells (ARPE19), Rhesus monkey retinal endothelial cells (RhRECs), and spontaneously immortalized human Müller cells (MIO-M1). After achieving complete cell confluence, cells were treated with (0 ng/µL, 5 ng/µL, 50 ng /µL y 500 ng/µL) of GH, PRL, IGF-1, and PL and VEGF, IGF-1 and TGF-B were measured with ELISA multiplex beads. We will be presenting and discussing the results in cell viability and expression of distinct cell growth factors induced by these somatotropins.

RATIONAL DESIGN FOR THE RECOMBINANT EXPRESSION OF THE RECEPTOR BINDING DOMAIN OF SARS-COV-2´ SPIKE GLYCOPROTEIN

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Background: COVID-19 represents a significant threat to global human health. SARS-CoV-2,the etiologic viral agent, needs to be under covered at the structural biology level to facilitate the rational design of diagnostic tests and vaccine candidates. SARS-CoV-2 Receptor Binding Domain of Spike protein(RBD-S) acts as the key to open the gate, to enter the cells during infection. Thus, it is a stronger candidate for designing effective antigens for vaccines and diagnostics. Here, we relied on the viral DNA codifying to RBD-S to use synthetic biology for optimizing there combinant expression of this (rRBD-S)as a proof of concept of rational designs of bioprocess for vaccine candidates and immunogens to improved rapid diagnostic tests. **Methods**: rRBD-S coding sequences inspired on RBD-S ectodomain from SARS-CoV-2 were designed, codon-optimized, tagged, synthesized ,cloned in an expression vector (pD444-MR), and transformed intoC41 (DE3)pLysS E. coli strain. Expression of recombinant RBD-S was resulting in a protein purified using Ni-IMAC (Nickel Immobilized metal affinity chromatography). **Results**: rRBD-S produced result in a ~30KDa protein with yields of4.618 gr L-1. Protein was recovered from the bacterial soluble fraction without refolding process. Conclusions: rRBD-S is an important tool for immunity diagnostics as Lateral-Flow-Devices, structural biology studies, and even as vaccine candidate for combating SARS-CoV-2. Notably considering the advantages of rational subunit vaccines for immune response against other vaccines technologies whose effectiveness in the long-term process has not been demonstrated yet.

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THERAPEUTIC EFFICACY OF ORMELOXIFENE AGAINST HEPATOCELLULAR CARCINOMA

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Background: Hepatocellular carcinoma (HCC) is the most common primary liver cancer and leading cause of cancer related deaths worldwide. Severe toxicity and drug resistance to available chemotherapeutic agents display ineffective clinical response. Therefore, drug repurposing is gaining attention owing to their known biological activities and excellent safety profiles. Ormeloxifene (ORM), non-steroidal, selective estrogen receptor modulator (SERM), and exhibit diverse pharmacological activities. The aim of this study is to assess the therapeutic activity of ORM and to investigate the underlying molecular mechanism against hepatocellular carcinoma. **Objective**: To investigate the therapeutic activity of ormeloxifene in human hepatocellular carcinoma cells. **Methodology**: MTT and colony formation assays were performed in SK-Hep-1, Hep3B and C3A cells. *In vitro* functional assays were carried out for investigating effect of ORM on migration and invasion abilities of HCC cells using Boyden chamber and Matrigel assays respectively. **Results**: Functional analysis revealed that ORM treatment led to suppression of proliferation and colony formation in human hepatocellular carcinoma cells in dose and time-dependent manner compared to vehicle treated group. ORM treatment, as shown by wound healing and Matrigel invasion assay, respectively, suppresses the migration and invasion of human hepatocellular carcinoma cells. Further, experiments are underway to determine the effect of ORM on EMT markers using western blotting and qPCR techniques. **Conclusion**: Taken together, ORM exhibited potent anticancer effects against HCC and could be further explored as a novel therapeutic modality for the treatment of HCC.

CAMPTOTHECIN-BASED DENDRIMERSOME FOR DRUG-GENE COMBINATION THERAPY: TEMPLATE DESIGN FOR TREATMENT OF DRUG-RESISTANT CANCER CELLS

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ABSTRACT

Background: Despite significant advances in detection and therapy, cancer remain some of the leading causes of unnatural deaths due to poor response to available therapeutic modalities and drug resistance. To remediate, drug-gene combination therapy has the potential to provide a synergistic therapeutic effect, to overcome drug resistance while limiting the severe side effects. However, the lack of such smart delivery systems able to simultaneously carry anti-cancer drugs and nucleic acids and to selectively deliver them to cancer tissues without secondary effects still limits the application of this therapeutic strategy. **Methods**: Here, a pro-drug dendrimer have been successfully synthesized by conjugating the PEGylated positively charged generation 3-diaminobutyric polypropylenimine (DAB) dendrimer to the anti-cancer drug camptothecin with a redox-sensitive disulphide linkage (-S-S-),via *in situ* two-step reaction, and validated using various biophysical, analytical and in vitro functional assays as a tumor relevant redox-responsive nanocarrier to facilitate successful drug and gene combination therapy against cancer. **Results**: The amphiphilic pro-drug-dendrimer was found to spontaneously self-assemble into cationic stable dendrimersomes in water(pH 7.4), where the drug forms vesicular bilayer with negative chirality and left-handed helical arrangement. The dendrimersome was not only able to release camptothecin at tumor-relevant intracellular higher redox conditions with the breakage of vesicle-structure, but also can condense DNA, leading to an enhanced cellular uptake of DNA and gene transfection in prostate cancer cells. **Conclusions**: Early promising *in vitro* results using such a novel redox-responsive drug-dendrimer delivery system proved its potential as a template towards successful applications in drug-gene combination therapy against various cancers.

THYMOQUINONE INHIBITS PROSTATE CANCER PROGRESSION BY MODULATING CYTOCHROME P450 (CYPS)

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Background: Prostate cancer (PCa) incidence and mortality remain high in African American (AA) than Caucasian American (CA) men. Multiple factors contribute to this critical disease disparity, androgen receptors(AR), and differences among variants of the genes such as Cytochrome P450 (CYP)are involved in androgen biosynthesis and metabolism that may switch to gene regulation for prostate growth .However, inhibitors have been approved for CYP genes, the major pitfall, undesirable side effects, and quality of life in those patients. Therefore, targeting CYPs with a natural compound, Thymoquinone (TQ), a constituent of Nigella sativa (black seed), potentially safe and curative option for PCa patients. **Methods**: Cell viability assay (MTT)was performed to determine IC50value in PCa cells (MDAPCa2b(AA) and LNCaP (CA)with varying concentrations of TQ for different time intervals. Further, Live/Dead cell assay, 3D invasion, migration, immunofluorescence (IF), qRT-PCR, and western blots were used to detect the role of TQ for the expression of CYPs gene. **Results**: Cell viability assay determines the optimal IC50valueof TQ in both cell lines. We showed overexpression of CYP3A4 and CYP17A1 stimulates proliferative, migratory, and invasive potential of PCa cells.

However, treatment with TQ significantly downregulated the expression of these genes in PCa cells. Further, TQ exhibits high specificity forMDAPCa2b compared to LNCaP cells ,confirmed by IF and immunoblots. **Conclusions**: These results demonstrate TQ could be the potent inhibitor of the active sites of the Cytochrome P450 enzymes and be used as potential therapeutics for men of African descent.

MUCIN 13 EXPRESSION IS AN EARLY INDICATOR OF HEPATOCELLULAR CARCINOMA DEVELOPMENT

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Background: Hepatocellular carcinoma (HCC) has a poor prognosis due to ineffective therapeutic modality and lack of an early marker for diagnosis. Studies show that increased mucin 13 (MUC13) expression as a possible oncogene and predictive biomarker for various cancers has been shown. But its expression and role in the development of HCC is very little known. **Objective**: The aim of this study is to investigate the MUC13 expression in chemically induced hepatocellular carcinoma model. **Methodology**: Male Wistar rats were subjected to a DEN and 2-Acetylaminofluorene (2-AAF) induced method for the development of hepatocellular carcinoma. Serum and tissues were collected at regular intervals and routinely validated for various stages of liver cancer. On formalin-fixed, paraffin-embedded tissues, immunohistochemistry and in situ hybridization were performed. The molecular interaction of mucin 13 and DEN were also performed using in silico analysis. **Results**: Histopathological analysis of liver tissues revealed the development of hepatocellular carcinoma with successive stages in chemically induced model HCC. Moreover, biochemical analysis showed a progressive increase in serum ALT, AST, and ALP levels, indicating the development and progression of hepatocellular damage. Notably, mucin 13 expression gradually increased during the progression of hepatocellular carcinoma. The treated group showed an increase in nuclear localization of mucin 13 as compared to the control group. In situ hybridization analysis revealed a reduction in miR-132 and miR-145, both of which are inversely related to mucin 13 expression. Furthermore, molecular docking analysis showed that DEN efficiently binds mucin 13 with high affinity and thus stabilizes it. **Conclusion**: These findings suggest that mucin 13 expression is linked to hepatocarcinogenesis and could be used as a candidate biomarker for HCC.

DEVELOPING AN ASSAY FOR EASY AND RAPID DETECTION OF ALS BIOMARKER(S): A HYPOTHESIS

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Background: Death of motor neurons is the key pathology underlying neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS). Biomarkers are chemical changes in the biological fluids. Biomarkers serving as a diagnostic tool should be specific to the concerned disease. Biomarkers indicating disease progression should be very sensitive to demonstrate changes during the disease process as well as therapeutics development. Biomarkers proposed for ALS include poly(GP) repeats in C9orf72, neurofilaments, miRNAs, glutathione and 4HNE in CSF, SOD1/TDP43 protein, poly(GP) repeats in C9orf72, neurofilaments, T regulatory cells, CRP, chitotriosidase, creatinine, creatinine kinase, miRNAs, glutamate, albumin, uric acid, glutathione, ferritin, 3-nitrotyrosine and 4HNE in blood, p75ECD, F2-isoprostane, collagen type 4, lucosylgalactosyl hydroxylysine, neoptrin and 8hydroxy-2`-deoxyguanosine in urine. Our hypothesis is to develop a kit-based assay for detection of ALS. Lateral flow immunoassays are one of the rapid, point-of-care diagnostic tests enabling high sensitivity and multiplexing. **Methods**: Leftover biological samples of ALS/Non-ALS individuals can be obtained from the clinics, age group 40-90. The samples can be evaluated for the expression of biomarkers and the levels can be compared between ALS and Non-ALS individuals. Using this preliminary data, kit-based assay can be developed that might be based on lateral flow principle. **Result**: The assay developed should be chromogenic and the intensity of chromogen should indicate the disease severity when compared to the reference.

Conclusion: Development of a successful kit-based assay will enable its rapid and easy detection and establish a new milestone in the field of ALS. **Keywords**: Amyotropic Lateral Sclerosis; Biomarkers; Lateral Flow Immunoassay

Faculty, Staff, & Other Category

DISCREPANCIES IN ORAL CARE STANDARDS IN HEAD AND NECK CANCER PATIENTS IN INDIA

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Introduction: Head and neck cancer patients have a very strict oral care requirement for a good quality of life. To address this a supportive oral care protocol (SOCP) was developed by us and validated with cancer care experts throughout the country. Oral supportive care is Standard of care for head and neck cancer patients, which is lacking in our country. Radiation caries, trismus, mucositis osteoradiaonecrosis, xerostomia and need for oral maxillofacial prosthesis are known side effect of cancer therapies. All this can be easily managed and minimized by providing optimal care as an integral part of cancer care. These health related disparities due to nonintergration of cancer care with oral care results in poor quality of life. We here present a case series of 10 patients with squamous cell carcinoma of oral and head and neck region enrolled at our center and their preventive and definitive management using our SOCP.
Key : Supportive oral care protocol, head and neck cancer, maxillofacial prosthesis, preventive dental care.

MODULATION OF POTE-2 EXPRESSION BY ncRNAS IN HEPATOCELLULAR CARCINOMA

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Background: Hepatocellular carcinoma (HCC) hasone of the highest incidents and mortality rates within the Hispanic population of South Texas. The Surveillance, Epidemiology, and End Results (SEER) cancer registry reports a 20.3% 5-year relative survival rate upon HCC diagnoses, which decreases in advanced stage cancers. The disproportionate impact on the Hispanic community and poor prognostics makes the search for better diagnostic measures imperative. A major step in bridging the disparity in HCC occurrence is the identification of potential biomarkers aiding in HCC diagnosis, surveillance, and treatment. POTE ankyrin domain members have been recognized as key promotors of tumorigenesis. POTE-2, a novel protein, has shown to be differentially regulated in liver cancer. Micro-RNAs (miRNAs) regulate protein expression through translational inhibition or mRNA degradation. This study aims to investigate possible role of miRNA-3662 in POTE-2expressionregulationin HCC cell lines. **Methods**: POTE-2 mRNA and protein were analyzed using RT-PCR and western blot respectively in liver cancer cell lines, SK-HEP1, C3A, HEPG2, and HEP-3B. POTE-2 mRNA was analyzed for potential miRNA binding sites using miRNAdb.org. Identified miRNAs were verified using miRNA specific RT-PCR. **Results**: SK-HEP1yielded relatively low mRNA with high protein, and the opposite was observed in C3A cells. SK-HEP1 cells showed higher proliferation, migration, and invasion. Analysis of POTE-2 mRNA using miRNA database identified potential miRNAs binding sites. MiRNA-3662 being the top candidate is being analyzed for its role in POTE-2 regulation. **Conclusions**: Regulation of POTE-2 mRNA by miRNA-3662 makes it a potential candidate for miRNA-based therapeutics in HCC.

SYSTEMS NETWORK ANALYSIS OF PROTEIN INTERACTION NETWORK (PIN) FOR DEDUCING MOLECULAR MECHANISTIC ACTION OF BaP INDUCED CARCINOGENESIS

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Abstract:
Background: Benzo[a]pyrene (BaP), a polycyclic aromatic hydrocarbon, has been placed in group 1 by IARC which indicates that it is a potential carcinogen to human beings. It has shown tumorigenic properties in approximately all animal model systems. In the current study, we have tried to identify the most probable biomolecular targets of BaP using systems biology approach. **Method**: All the proteins that interact with BaP were extracted from T3DB. STRING-db was used to generate the Protein-protein interaction network (PPIN). Various apps of cytoscape software were used for network analysis, modulation and GO enrichment analysis. By developing biokinetic models, we then tried to find the impact of BaP on the top three most probable biomolecular targets and how whole of the cell cycle is getting perturbed which may ultimately lead to carcinogenesis. Apart from this, in this study we have also tried to propose a hypothesis of removing BaP from the cell vicinity by exploiting the scavenging properties of carbon based nanoparticles using in silico approach. **Result**: 4000 genes were extracted from T3DB for which network was generated. On network analysis, 2058 nodes were obtained that were connected by 13850 edges. MCODE created 65 clusters which had 411 seed proteins and enrichment analysis showed that most of the proteins present in the network participate in cell cycle regulatory pathways. On molecular docking analysis QSOX1, PTGS2 and NOS2 emerged out to be top three most probable biomolecular targets of BaP out of which PTGS2 is directly involved in cell cycle regulatory pathways. Biomolecular kinetics showed that when PTGS2 gets hampered by BaP, cell cycle regulation gets disturbed and cell may become cancerous. On in silico analysis of the scavenging potential of carbon based nanoparticles, BaP showed higher binding efficiencies for SWCNT and MWCNT as compared with QSOX1. **Conclusion**: Based on the in silico docking results we can hypothesize that carbon based nanoparticles can be used to scavenge BaP molecules from the cell vicinity.
Keywords: Benzo(alpha)pyrene, carcenogenesis, PPIN, systems biology

STEM CELL TECHNOLOGY FOR AGE RELATED MACULAR DEGENERATION INTERVENTION

Laura Valdez

Retinal pigmented epithelium (RPE) cells are located between the choroid and photoreceptors within the eye and are essential to provide nutrients from blood to rods and cones, as well retinoids of the visual cycle. Vision loss and various ocular diseases are attributable to the degeneration or dysfunction of the RPE cells, leading to blindness. One of the major ocular problem from RPE dysfunction is macular degeneration. Age-related macular degeneration (AMD) can be frequently diagnosed in patients over the age of 60. In the early stages of AMD, some symptoms may not be noticeable but will lead to vision loss in both eyes. Induced pluripotent stem cells (iPSC) can be derived from somatic cells and have been used in regenerative medicine, replacing cells that have been lost or damaged. iPSC culture can be derived from a 'patient-match' because these cells come from blood or skin cells. I plan to study how RPE cells can be protected from hypoxia, hyperglycemia, and pro-inflammatory conditions. Results from this will provide important information on the molecular pathway on RPE survival under different pathological conditions. Our long-term goal is to investigate how to protect RPE from dysfunction due to aging and explore a novel approach to preserve stem cell derived RPE for transplantation in AMD to restore vision and prevent vision loss.

EFFECT OF IGF-1 ON POST-TRANSLATIONAL MODIFICATIONS (PTMS) ON A MODEL OF DIABETES-INDUCED CARDIAC HYPERTROPHY IN H9c2 CARDIOMYOBLAST CELL LINE

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Diabetic cardiomyocytes alter their post-translational modification levels, especially in O-GlcNAcylation and Phosphorylation. Insulin-like growth factor 1 (IGF-1) is a peptide known to induce favorable cardiovascular effects in patients with heart failure. Here, we focus on the downstream effects ofIGF-1 as a potential DCM treatment.H9c2 cells were cultured in DMEM-10% FBS at 80% of confluence. As a cellular model of cardiac hypertrophy, we used a high-glucose medium (30 mM glucose) in the presence or absence of 10 µmol/L of IGF-1 (HG and HG+IGF-1). As control groups, we used cells cultured in low-glucose DMEM (glucose 5mM) in the presence or absence of IGF-1 (LG and LG+IGF-1). After 48 hs of incubation, cell area was measured, and then proteins were extracted to analyze PTMs patterns by Western Blot. Cell area was measured to corroborate the effects of IGF-1 and high glucose concentration on hypertrophy induction. We found an increase in the area (a.u.) in the groups LG+IGF-1, HG, and HG + IGF-1 compared with the LG group (LG:1376±71; LG+IGF-1: 2247±116; HG:2215±105;HG+IGF-1:2442±94). Also, the groups treated with IGF-1 showed a decrease in O-GlcNAcylation levels (a.u.) compared with the HG group (LG vs.HG vs.HG+IGF-1; vs.189.4±20 vs.132.1±12). Regarding the phospho-tyrosine modifications, IGF-1 significantly reduced the p-Tyr levels in the HG+IGF-1 group compared with control groups (LG vs LG+IGF-1 vs HG vs HG+IGF-1; LG:100.0±2.4; LG+IGF-1:89.45±6.5: HG:74.73±6.5; HG+IGF-1:44.45±5.6).These results show that IGF-1 signaling pathway stimulation lowers the levels of cardiac proteins O-GlcNAcylation and Tyrosine phosphorylation in high glucose.

EPIDEMIOLOGICAL ALGORITHM AND EARLY MOLECULAR TESTING TO PREVENT COVID-19 OUTBREAKS IN A MEXICAN ONCOLOGIC CENTER.

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Introduction: Prevention strategies and detection of latent COVID-19 infections in oncology staff and oncologic patients are essential to prevent outbreaks in a cancer center. In this study, we used two statistical predictive models in oncology staff and patients from the radiotherapy area to prevent outbreaks and detect COVID-19 cases. **Methods**: Staff and patients answered a questionnaire (electronic and paper surveys, respectively) with clinical and epidemiological information. The data was collected through two online survey tools: Real-Time Tracking (R-Track) and Summary of Factors (S-Facts). According to the algorithm's models, cut-off values were established. SARS-CoV-2 qRT-PCR tests confirmed the algorithm's positive individuals. **Results**: Oncology staff members (n=142) were tested, and 14% (n=20) were positives for the R-Track algorithm; 75% (n=15) were qRT-PCR positive. The S-Facts algorithm identified 7.75% (n=11) positive oncology staff members, and 81.82% (n=9) were qRT-PCR positive. Oncology patients (n=369) were evaluated, and 1.36% (n=5) were positive for the algorithms. The 5 patients (100%) were confirmed by qRT-PCR at a very early stage. **Conclusions**: The proposed algorithms could prove to become an essential prevention tool in countries where qRT-PCR tests and vaccines are insufficient for the population.
Keywords: COVID-19, epidemiology, molecular testing, oncology

TREATMENT OF PROSTATE CANCER BY THE INTERACTION OF A-PELTATIN WITH TUBULIN RECEPTOR

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ABSTRACT: Prostate Cancer is the most common cancer of today's era that damages the excretory system as well as reproductive power of human beings very badly. Since I'm likely to encounter these problems by inhibiting the dynamics of tubulin receptors of the human body by its interaction with α-Peltatin that may be useful for the treatment of prostate cancer and possibly other diseases like heart failure, and muscular dystrophy. α-Peltatin is a herbal therapy medication obtained from the dried rhizome and roots of Podophyllum peltatum when applied typically, it is a strong irritant to the skin and mucous membranes and can lead to poisoning because of systemic absorption and hence used to treat a vast variety of cancers through high-throughput screening. And also to highlight the gaps in our knowledge and explore future research needs. It includes pancreatic cancer, breast cancer, lung cancer, brain cancer, etc. This treatment is administered to the patient through intravenous injections. Optical ultracentrifuge studies of α-Peltatin treated tubulin show a small reduction in 25-S to 30-S peaks at 0°C. In electron microscopic studies the ring structure of tubulin is seen at 0°C but disappears if the temperature of tubulin incubated with α-Peltatin is raised to body temperature. α-Peltatin repels the replication of chromatin reticulum in mitosis thereby inhibiting the fast-growing cancerous cells of the body for current as well as for future generations. Here I'm using Firefly software through the EHT method to get an accurate result in short time intervals. Interaction of α-Peltatin with the Tubulin promotes receptor-independent activation of G-proteins (also called Guanine Nucleotide-Binding proteins that act as a molecular switch inside cells, and are involved in transmitting signals from a variety of stimuli outside a cell to its interior) which helps in modifying cell morphology for the treatment of such cancerous cells. The interaction studies discussed in this research paper will also be a boon for treating the problems caused by the SARS COVID-19 virus also in the incoming periods. Antimitotic drugs such as the α-Peltatin and some other antimitotic natural products show a promising result in prostate cancer therapy. However, the toxicity of these drugs as well as acquired drug resistance allows for an opportunity to develop agents with increase tolerability and specificity to the body cells. My investigation has opened the pathways of cancer cell resistance to antimitotic drugs that will result in the subsequent identification of novel biomarkers for future chemotherapy possessing increased efficacy in an innovative way for today's such cancer therapy.

KEYWORDS: Prostate Cancer, α-Peltatin, G-protein, tubulin, interaction, firefly, EHT, polymerization, inhibitors, competitive mechanism.

FATTY ACID ACCUMULATION IN HAIR FOLLICLE INDUCE ALOPECIA

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Background: Hair is an essential indicator of individual characteristics such as self-image, identity, ethnicity, and health. Loss of hair from any part of the body for any reason is called alopecia. The alopecia is of two kinds, scarring alopecia and non-scarring alopecia. The scarring alopecia is divided into three types depending upon the inflammatory cell presence: lymphocytic, neutrophilic, and mixed. Scarring alopecia's is typically caused by inflammation, resulting in the hair follicle's destruction leading to irreversible hair loss. The etiology and pathogenesis of PCA remain unclear, but PCA is currently treated as an inflammatory disorder. The treatment options for PCA are limited and are not very effective in controlling the disease progression. **Methods**: One of the previous studies elucidated that sterol intermediate of cholesterol biosynthesis initiates inflammation. At an earlier study, the gene expression profile identified that abnormalities of lipid metabolism and sterol intermediates accumulation underlie the pathogenesis of PCA. Here we performed a metabolomics approach to identify metabolites unique to the lymphocytic PCA, frontal fibrosing alopecia (FFA), and the K14-aryl hydrocarbon receptor (K14-AhR-CA) mouse model. **Results**: Global metabolomics profiles of

unaffected and affected FFA scalp biopsies and skin biopsies from K14-AhR-CA mice and wild-type littermates (Week 0-9) were generated on GC/MS and LC/MS/MS platforms. The earliest change in the K14 –AhR mouse was the accumulation of fatty acids like behenate, lignoceric, and hexacosanaoate. Interestingly, a pile of fatty acid caproate and laurate were more in scalp biopsies. This revealed the changes in mitochondrial metabolism in the FFA patients and the transgenic mice. Decreased glutathione (GSH) and elevated levels of oxidized glutathione (GSSG) were also observed in FFA samples and the K14-AhR mice, suggesting that mitochondrial impairment and lowered energy metabolism an indicators of early disease pathogenesis. The accumulation of fatty acid and the oxidative stress response were observed before the loss of stem cells and the onset of inflammation in the K14-AhR mouse model and FFA samples. **Conclusion**: Our data suggest that the accumulation of fatty acids evokes oxidative stress, promotes inflammation and cell death in the hair follicle and leads to alopecia.

IN SILICO ANALYSIS OF c-MET EXPRESSION AND ITS CORRELATION WITH METABOLIC NETWORK IN HEAD AND NECK CANCER

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Abstract
Background: Head and Neck Squamous Cell Carcinoma (HNSCC) is strongly associated with metabolic dysregulations. c-Met activation is important for high glucose induced acquisition of mesenchymal phenotype, survival under high glucose stress in HNSCC cells. Here, we utilise the *In silico* approach to analyse the c-Met expression in the head and neck cancer data extracted from The Cancer Genome Atlas (TCGA) database and its strong correlation with genes associated with cancer cell metabolism. **Methods**: In the current study, our investigations were performed using different bioinformatics tools and databases, including GEPIA (a webserver which extracts data from the Cancer Genome Atlas (TCGA) data portal and the GTEx database of normal tissues. http://gepia.cancer-pku.cn), and STRING databases (functional protein association networks (https://string-db.org/). **Results**: Here, we report the upregulation of c-Met in HNSCC patient cases along with a significant upregulation of major metabolic genes such as GLUT-1, HK-II, LDH-A, MCT-1, PFKin the HNSCC patient cases as compared to normal samples obtained from TCGA databases. Moreover, the current study revealed the c-Met overexpression across the histological and molecular subtypes of different HNSCC patient cases. We also showed the possible association of c-Met expression between the metabolic gene expression in HNSCC patient samples. We showed that patients with higher expression of c-Met had a shorter overall survival time and worse prognosis, and c-Met higher-expression levels also resulted in worse disease free survival in many cancers, confirming the association of c-Met and metabolic related genes with poor clinical outcomes in HNSCC. Furthermore, the protein-protein network analysis identifies the co-expression of metabolic associated genes with the c-Met. **Conclusions**: Our analysis suggests the correlation with higher expression of c-Met with a shorter overall survival and worse prognosis of HNSCC patients. Furthermore, the protein-protein network analysis identifies the co-expression of metabolic associated genes with the c-Met expression. Those genes with moderate and very strong positive correlations with c-Met expression in cancers are involved in the glucose metabolism, lipid metabolism, cell cycle process. Considering c-Met inhibition in HNSCC would be an important strategy for therapy that may favour the sensitization of HNSCC through metabolic network.
Keywords: c-Met, HNSCC, Metabolism, In-silico, TCGA

SMOKING AND DRINKING *ACTIVATES NF-KB /IL-6 AXIS TO PROMOTE INFLAMMATION DURING CERVICAL CARCINOGENESIS*

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ABSTRACT

BACKGROUND: High-risk strains of HPV are known to cause cervical cancer. Multiple clinical studies have emphasized that smoking and drinking are critical risk factors for cervical cancer and its high-grade precursors. In this study, we investigated the molecular mechanisms involved in the interplay of smoking and/or drinking with HPV infectivity and defined a systematic therapeutic approach for their attenuation in cervical cancer. **METHODS:** The impact of benzo[a]pyrene (B[a]P) and/or ethanol (EtOH) exposure on cervical cancer cells was assessed by measuring changes in cell proliferation, clonogenicity, biophysical properties, cell migration, and invasion. Expression of HPV16 E6/E7, NF-κB, cytokines, cell cycle, and inflammation mediators was determined using qRT-PCR, immunoblotting, ELISA, luciferase reporter assay and confocal microscopy. **RESULTS:** The exposure of cervical cancer cells to B[a]P and/or EtOH altered the expression of HPV16 E6/E7 oncogenes and EMT markers; it also enhanced cellular clonogenicity, migration, and invasion. In addition, B[a]P and/or EtOH exposure promoted inflammation pathways through TNF-α and NF-κB signaling, leading to IL-6 upregulation and activation of VEGFA. These molecular effects caused by B[a]P and/or EtOH exposure were effectively attenuated by Cur/PLGA-Cur. **CONCLUSIONS:** These data suggest a molecular link between smoking, drinking, and HPV infectivity in cervical carcinogenesis. However, these events were determined to be attenuated by treatment with Cur/PLGA-Cur treatment, implying its role in cervical cancer prevention/treatment. **Keywords:** Cervical cancer, HPV16 E6/E7; Cigarette smoking and drinking; Benzo[a]pyrene; Human immunodeficiency virus; NF-κB

HOW RISK PERCEPTIONS AND LEVEL OF TRUST OF INFORMATION INFLUENCE INDIVIDUALS' HEALTH SERVICES USAGE

Wan-Lin Chang

Background: When facing health-related issues, decision-making is not an easy thing. Some people look for advice from health care professionals, and some people trust their family members' and friends' experiences more. Previous studies in health communication have suggested differences across various demographic groups in information seeking access and skills, including variables related to the knowledge gap assumption and individuals' risk perceptions. **Methods**: Multiple linear regression and logistic regression are used to examine how individuals' health risk perceptions influence their health service usage by analyzing the Health Information National Trends Survey (HINTS) 5 Cycle 4. HINTS conducts national surveys to monitor the influence and changes in cancer communication among U.S. adult citizens. It is a cross-sectional survey of the adult population conducted every few years by the National Cancer Institute (NCI) since 2003. HINTS 5 Cycle 4 data were collected from February through June in 2020 with 3,865 respondents participated in the study. **Results**: The results showed that people who have higher risk perceptions are more likely to seek health information and seek information online. In addition, socioeconomic status (SES), age, and race/ethnicity also impact individuals' health information-seeking behaviors as well as health service usage. **Conclusion**: Health professionals' recommendations often have a significant influence on individuals' decision-making. If health professionals can spend just a couple of extra minutes in conversation with patients and their family members to emphasize the importance of health service usage (eg. Examination, regular body checkout), individuals' willingness of using health services may be changed.
Keywords: internet usage, trust, risk perceptions, health service usage, information seeking

RACIALLY DISPARATE EXPRESSION OF SPANXB1 IN TRIPLE NEGATIVE BREAST CANCER

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Background: African American (AA) women are diagnosed more frequently with the triple negative breast cancer(TNBC), have an early onset and frequent recurrence, leading to an higher mortality than Caucasian (American (CA) women. SPANXB1 belongs to the SPANX family of cancer testis antigens (CTAs) expressed exclusively in the testis. Its overexpression; however, has also been detected in melanoma, colon, lung, and ovarian carcinomas. Here, we assessed the expression of SPANXB1in TNBCs from AA and CA women. **Methods**: SPANXB1 expression was examined by immunohistochemistry in FFPE tissues from 20 CA and 20 AATNBCs and 10 normal cases. Digital pathology system (Leica Bioscience) was employed to evaluate extent and intensity of the staining.SPANXB1 staining was compared between racial groups and correlated with various clinic pathological parameters. **Results**: Normal breast tissues and surrounding stroma were negative for SPANXB1and its expression was only detected in cancer tissues. SPANXB1 staining was predominantly cytoplasmic with diffuse nuclear expression in some cases.SPANXB1 expression was slightly higher in AA compared to CATNBCs. A slight but non-significant overexpression of SPANXB1 was also recorded in AATNBC with positive lymph node status and family history of cancer compared to that in CATNBC .No significant association of SPANXB1with stage was observed. An appreciable level of SPANXB1 was detected inductal in situ carcinomas, adjacent to invasive cancer suggesting a role of SANXB1in early progression. **Conclusion**: Exclusive abundance of SPANXB1 in TNBCs suggest its pathobiological and translational significance as a novel molecular target for biomarker and therapeutic development.

SERUM PROFILING OF INFLAMMATORY CYTOKINES AND OBESITY AND STRESS-ASSOCIATED HORMONES IN WOMEN WITH OR WITHOUT BREAST CANCER

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Background: Breast cancer (BC)health disparities exist between African American (AA)and Caucasian American (CA) women. AA women develop BC earlier in life and are diagnosed with more aggressive phenotype leading to a poorer prognosis than their CA counterparts. Several factors, ranging from social, economic, behavioral to inherent biological differences, are associated with disparities and often one factor influences the other. Here we examined the levels of stress (cortisol),obesity (leptin) hormones and inflammatory cytokines (resistin and IL6) in serum samples obtained from AA and CA women with or without BC. **Methods**: AA and CA women who visited University of South Alabama Health Hospitals, were asked to participate in this study voluntarily and their consent was obtained. Blood samples were collected from a total of 30 women without BC (15 AA and 15 CA) and 44 with a BC diagnosis (22 AA and 22 CA). Serum was isolated by centrifugation after coagulation, aliquoted and stored at −80 °C. Serum levels of resistin, IL-6, leptin, and cortisol were quantified by performing Enzyme linked Immunosorbent assay using commercial kits. Statistical analyses were performed using Graph pad prism 8.0. **Results**: High levels of serum cortisol, leptin, resistin and IL-6 were observed in BC patients. Furthermore, AA women with or without BC diagnosis showed significantly higher levels of these hormones and cytokines than CA women. **Conclusion**: Higher levels of cortisol, leptin, resistin and IL-6 in BC patients suggest their role in aggressive tumor phenotypes, immune suppression and consequently poorer prognosis of the patients.

EPOXYAZADIRADIONE EXHIBIT ANTI-CANCER ACTIVITIES BY MODULATING LNCRNAS EXPRESSION IN PANCREATIC CANCER

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Background: *Azadirachta indica* (neem), a medicinal plant under Meliaceae family, is found in the Indian subcontinent. One of the limonoids, epoxyazadiradione (EPA), is a phytochemical isolated from the seeds of this tree. This is widely used in traditional medicine to treat a variety of human ailments. Although EPA has shown promise against some cancer types, its efficacy against pancreatic cancer and the underlying mechanism remains elusive. **Aim**: We examined the anti-cancer activity of EPA against pancreatic cancer cells. We also examined the underlying mechanism. **Methods**: Pancreatic cancer cell lines(PANC-1 andMiaPaCa-2)were used during the study. We performed MTT assay, clonogenic colony formation assay for cytotoxicity. The western blotting was performed to examine the expression pattern of various apoptotic proteins. Real-time PCR was performed to detect quantitative lncRNAs expression. **Results and Discussion**: After treatment with EPA, the viability and proliferation of pancreatic cancer cells was decreased in a dose- and time-dependent manner.EPAsuppressed the expression of apoptotic proteins involved in survival, proliferation, migration and invasion. EPA also suppressed the expression of MMP-9in a concentration-dependent manner in pancreatic cancer cells. In addition, the limonoid also modulated the expression of lncRNAs(MEG-3, GAS-5, H19 and MHRT). **Conclusion**: EPA exhibitedstrong anti-cancer activitiesagainst pancreatic cancer by modulating multiple cancer-related signalling molecules.

CONSERVATIVE VERSUS SURGICAL MANAGEMENT FOR NON-TRAUMATIC SUBARACHNOID HEMORRHAGE

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Background: Non-Traumatic headache is a common complaint of patients going to the emergency room. Most are benign, and a low percentage of cases present with non-traumatic subarachnoid hemorrhage (ntSAH). This is a life-threatening emergency with a high risk of morbidity and mortality. Diagnostic approach and treatment will impact patient outcome. **Methods**: Nine articles have been selected from Pubmed, Google Scholar, International Journal of Emergency Medicine, Journal of Neurosurgery, International Journal of Emergency Medicine, including cohort studies, a cross-sectional study, and several observational studies and clinical trials. **Results**: There is no consensus about treating patients with no traumatic Subarachnoid Hemorrhage (ntSAH) among expert clinicians worldwide. Many concerns arise from an attempt to establish a protocol for the individual patient. However, in some institutions, the wide variety of management practice testifies to non-agreements in the medical community. We sought to design a survey that would highlight controversy in the modern management of ntSAH and identify specific areas of interest for further research. **Conclusions**: Early diagnosis and adequate management for ntSAH are crucial for a patient's survival. There are many tools and strategies to approach and treat our patients with severe headaches, and we must understand the strengths and limitations of each strategy. Early aneurysm repair is generally considered the most vital strategy to reduce.