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## Effect of PDGF-BB on Human Retinal Pericytes

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## Effect of PDGF-BB on Human Retinal Pericytes

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### Abstract

**Background** – The majority of ocular conditions seen in patients with diabetic retinopathy are a result of damage to the retinal vasculature, which leads to microaneurysms, hemorrhage, and eventually neovascularization. The first step in the pathogenesis of these conditions is derived from the loss of Human Retinal Pericytes (HRPs), or cells which are essential to the preservation of the integrity of the retinal vasculature, and PDGF-BB is the primary promotor of growth and recruitment for HRPs.

**Aim** - Patients with NPDR produce lower levels of PDGF-BB than in normal conditions, which could contribute to the loss of pericytes early in diabetic retinopathy. The purpose of this study is to evaluate the effect of PDGF-BB on HRPs *in vitro* to determine whether or not the longevity of the HRPs can be preserved with the intent of contributing to development of therapeutic interventions for patients with diabetic retinopathy. This is the first PDGF-BB study on its effect on the viability and longevity of HRPs.

**Methods** – Three groups of HRPs were treated with three different concentrations of PDGF-BB which correlate to concentrations found in patients with PDR, NPDR, and normal conditions. These three concentrations were also compared with a negative control group which was not treated. After 24 and 48 hours the viable cells were counted by triptan blue measurements. The results were reported by evaluating viable cells at 24 and 48 hours, growth of each group between these time periods, and significant growth differences between groups at each time period. Each group was grown in triplicates and an average from these triplicates was used during analysis.

**Results** – Of the results found, three were clinically significant. Pertaining to viability, the NPDR group was the only one with a significant result at 24 hours. Growth difference analysis was significant for the PDR group at the 24-hour period. Growth difference between all groups was significant at the 24 hours mark but not at 48.

**Conclusion** – Of the results obtained, significant results were only seen at the 24 hours period which is thought to be a result of the well space not being large enough to accommodate growth beyond the 24-hour time frame. The finding of a statistically significant difference at 24 hours but not 48 hours further suggests this as the complication as well. That being said, significant growth difference was seen with the PDR group, which was treated with high levels of PDGF-BB. This finding is consistent with the hypothesis that PDGF-BB levels encourage the growth of HRP cells.

*Discussion* - Previous clinical trials on PDGF-BB inhibitors showed that they did not help patients with diabetic retinopathy due to the inherent deficiency of HRPs found in these patients. We anticipate results from this study will support an opposing approach by supplementing PDGF-BB, rather than blocking leading to innovative clinical outcomes.