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## Differential gene expression profiling and mechanism of VEGF-B in photoreceptors degeneration

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Despite its early discovery and high sequence homology to the other VEGF family members, the molecular mechanism of VEGF-B in retinal degeneration in a disease model of retinitis pigmentosa has not been delineated yet. Thus, we aimed to test our hypothesis that either VEGF-B functions as a potent photoreceptors survival or rescue factor in retinal degenerative disease. We used different animal models and cultured cells to show that VEGF-B is a potent neuro protective and survival factor. Retinal thickness was measured by IF and H&E staining in VEGF-B, treated rd1 and VEGF-B<sup>-/-</sup> mice retinae compared with their respective controls. VEGF-B regulated genes related to neurotrophic/survival, angiogenic, apoptotic, antioxidants & oxidative stress were tested using microarray, pathway focused PCR-array, qPCR and western. Role of VEGF-B mediated survival of photoreceptors were examined after VEGF-B and H<sub>2</sub>O<sub>2</sub> treatment. Increased retinal thickness was observed in VEGF-B treatment whereas reduced in VEGFB<sup>-/-</sup> mice. VEGF-B activates the expression of the protein and antioxidant defense, cell survival related genes whereas inhibits oxidative damage, cell death related genes in rd1 mic retinae. Western and IF confirms VEGF-B specificity and increased rho-4D2 positivity, respectively, in VEGF-B treated rd1 mice retina. Our finding shows that VEGF-B treatment up-regulates the array of survival & antioxidant related genes, which activates the glutathione defense system and rescues and protect the retinal photoreceptor cells in rd1 mice. Thus, our data demonstrates VEGF-B play a pivotal role in conserving/survival under pathological condition and may be of therapeutic value in treating retinal degenerative disease.

### Biography

Pachiappan Arjunan has completed his PhD from National University of Singapore (NUS) and postdoctoral training from National Eye Institute/NIH. He is a Junior Faculty in the Dept. of Periodontics at GRU. He has published more than 20 papers in reputed journals and has been serving as an honorable consulting editor of *Eye and Brain*, permanent reviewer of *JoVE*, and volunteer reviewer for more than 10 journals etc.

### Notes: