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Muller Cell Expression of CCN2 is Influenced by Temporal Conditions

Purpose: CTGF, or CCN2, is a matricellular protein implicated in many physiological and pathological processes. Specifically, it is involved in cell adhesion, migration, chemotaxis, fibrosis, angiogenesis, and cell differentiation. In the retina, retinal Muller Cells (RMC's) express most of the CTGF of the neural tissue and play a role in retinal progenitor differentiation. Previous research has looked at CTGF expression in time course however the first 24 hours have been largely ignored. In vitro analysis of protein expression of these cells can find temporal patterns of CTGF and its relation to other notable gene expression.
Methods: RMCs were grown in culture and protein was isolated from them in a time-dependence manner. 0.5, 1.5, 3.0, 6.0, 12.0, and 24.0 hours were the collection times. Western blotting was then performed to compare protein expression between different time points. GAPDH was used as the housekeeping protein.
Results: Preliminary data shows CTGF to have maximal protein expression at 6.0 hours followed by a continuous reduction at t=12.0 and t=24.0 hours. Glial fibrillary acidic protein (GFAP) followed the same temporal pattern while Glutamine Synthetase continued to increase in expression at 12 and 24 hours.
Conclusion: There are significant changes in gene expression of RMCs that are temporally regulated. The first 24 hours are critical in terms of CTGF expression and GFAP expression as well. Targeted therapies that aim to either reduce their expression or their downstream effects should be further studied in vitro and in vivo to look at the effects of reducing high initial expression to evaluate time sensitivity.