

## **MicroRNA-150 (miR-150) as a Potential Biomarker for Diabetic Retinopathy**

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Diabetic retinopathy (DR) is a known chronic complication of diabetes mellitus and is one of the leading causes of visual impairment. The chronic inflammation associated with DR poses large risks not only for the vasculature but also for the surrounding neuronal tissue. Potential biomarkers, especially those surrounding microRNAs (miRNAs), have been proposed to indicate the progression of DR. Levels of certain miRNAs have been shown to be either down or upregulated in type 1 diabetes patients and have shown correlations with specific types of DR. MicroRNA-150 (miR-150) has also been shown to have protective effects on cells in hypoxic environments, but when downregulated, miR-150 actually induces apoptosis. And, it has been shown to be downregulated in patients with type 1 and type 2 diabetes as well as patients with obesity. We hypothesize then that the levels of miR-150 from a peripheral blood sample should be indicative of the progression of DR and may be used for potential early intervention. In this project, we assessed miR-150 levels in the peripheral blood mononuclear cells (MNCs) of individuals with different severities of DR by isolating mononuclear cells and extracting RNA. We then reverse-transcribed the RNA into cDNA and used RT-qPCR to measure the levels of miR-150 in individuals with varying DR severity. MiR-150 levels in the MNCS were decreased in individuals with diabetes with no retinopathy, moderate NPDR and severe NPDR groups when compared to control individuals; however, there was a marginal increase in the miR-150 mild NPDR group. The data could show evidence that a peripheral blood draw could be used as a less invasive approach to assessing the severity of diabetic retinopathy in patients. This would change the disease management and future treatments individually.