

## **Real-Time Unbiased Pathogen Detection in Infectious Uveitis**

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Uveitis is a sight-threatening intraocular inflammation that affects young working-age individuals, resulting in significant socioeconomic impacts. Rapid and accurate diagnosis is critical for arresting progression and limiting visual loss, but is currently challenged by the diversity of pathogens involved, small sample sizes, and the paucity of microbes within them. The laboratory workup relies on multiple immunological tests and pathogen-targeted singleplex polymerase chain reaction (PCR) assays, an approach that increases significantly the time to diagnosis and in many cases is unrevealing. As a result, patients can be treated for weeks or months using one-size-fits-all therapeutic trials that are not tailored for an individual and do not work for everyone. Because metagenomic next-generation sequencing makes no assumptions about the underlying etiology of infectious uveitis, we chose to integrate the latest technical and bioinformatic advances that we believe now make possible the development of an innovative all-in-one diagnostic assay for comprehensive pathogen detection that will streamline diagnosis, improve diagnostic yield, and reduce time to actionable results from days/weeks, to hours. Additionally, results from our research will do much to define the currently unknown range of pathogens capable of triggering or being associated with the pathogenesis of uveitis, and we will be capable of detecting potential sublineages of known microbes that are especially pathogenic. We hope that with support received from this grant we will be able to develop an unparalleled diagnostic test validated for clinical application that will translate into improved care for patients presenting with this sight-threatening disease.