



THE OCULAR IMMUNOLOGY
AND UVEITIS FOUNDATION

Dedicated to Eye Disease Cure and Education

Polymerase Chain Reaction Technique and Technology for Helping to Establish a Diagnosis in Patients with Uveitis

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Polymerase Chain Reaction (PCR) technology is but one of the molecular biology techniques that has revolutionized the practice of medicine. Originally a research tool exclusively, PCR has come into its own in a very wide variety of clinical care areas, including tissue typing, molecular genetics for genetic counseling, forensic medicine, gene identification for disease susceptibility or causation, and, particularly in the area of uveitis, for identification of infectious causes of disease. Our involvement with PCR began in the laboratory for purposes completely unrelated to clinical diagnosis. Specifically, we used internally-nested PCR oligonucleotide primer pairs in our work on the spectrum of fibronectin isoforms in normal, wounded, and healing corneas. But it soon became apparent that this laboratory technique might also be exploited in the analysis of biopsied ocular tissue, including vitreous, in an effort to identify putative microbial causes of inflammation. Accordingly, we established a "stable" of 10 oligonucleotide primer pairs, with sequences determined from the literature and GeneBank data banks, for microbes which can be associated with uveitis, scleritis, and keratitis.

The stringency requirements for laboratory cleanliness and for safeguards against inadvertent contamination preclude most research laboratories from offering PCR-based diagnostic assays, and this holds true for our research laboratory as well. Still, as can be judged from the case "published" on this Web Site in the Original Articles Section, March Issue, on Ophthalmic Whipple's Disease, it becomes instantly apparent how useful PCR can be in firmly establishing a diagnosis, and how sight saving the findings can be in certain instances. We have similar cases of Varicella Zoster, tuberculosis, Lyme disease, syphilis, herpes simplex virus, and cat scratch disease where the results of PCR analysis of biopsied material (usually vitreous) has shed light on the underlying cause of the blinding inflammation, enabling specific antibiotic therapy to be implemented, with the gratifying result similar to that reported on the Ophthalmic Whipple's Disease case.

We are hopeful that increasing numbers of clinical laboratories will make available their facilities for diagnostic PCR, and we believe that when such resources are increasingly available, it will be discovered that more cases of uveitis than we currently imagine are secondary to a microbe.