THE HARTWELL FOUNDATION

2010 Individual Biomedical Research Award

Review of Proposed Research

Investigator: **Adriana Tremoulet, MD**
Assistant Professor
Department of Pediatrics

Institution: **University of California, San Diego**

Proposal: **Biomarker Panel for Diagnosing Kawasaki Disease**

Kawasaki disease (KD) is an acute, self-limited illness of infants and children that involves inflammation of the blood vessels, particularly the coronary arteries. The illness is characterized variously by fever and overt clinical signs that include red eyes, red cracked lips, red tongue, red swollen hands and feet, swelling of the lymph nodes of the neck or rash. In the United States, 5-6,000 cases are identified each year, involving mainly children less than 5 years of age. KD is most common among children of Japanese or Korean heritage. There is no diagnostic test for KD, yet remarkably, it is the leading cause of pediatric acquired heart disease in the United States. In this regard, Dr. Tremoulet and other groups have recently shown that a delay in diagnosis and treatment of KD leads to an increased risk of coronary artery aneurysms (ballooning of the arteries of the heart), which can lead to artery occlusion and cardiac ischemia, thus producing significant morbidity and mortality. Current diagnosis of KD is limited to overt clinical signs (e.g. rash, bloodshot eyes) and a prolonged fever; but these signs overlap with other fever causing infections and are confounded by the symptoms of scarlet fever, measles, rheumatoid arthritis, respiratory and digestive tract infections, neurological diseases, or benign rash-fever illnesses caused by viruses that require no specific treatment. Worse, the diagnosis of KD is further complicated because in 15-30% of affected children many of the clinical signs are absent. Fortunately, timely diagnosis and treatment of children with KD with intravenous immunoglobulin (IVIG, the antibody fraction of human blood) reduces the risk of coronary artery aneurysms from 25% to 5%. Although treatment with IVIG sometimes interferes with the effectiveness of immunizations against measles, mumps, rubella and chickenpox, it is generally well-tolerated with few severe complications. Without a confirmatory diagnostic test to identify children with KD, it will not be possible to reduce the morbidity and mortality in affected children. Single biomarkers have not been sufficiently specific to identify KD patients. To address the unmet need, Adri proposes to identify a novel panel of biomarkers that will differentiate KD patients from children with benign rash-fever illnesses. If successful, Adri expects a point of service test for diagnosing KD will be available in every emergency room, pediatric office, and urgent care center in the U.S. within 5-10 years.