

## MS Genetics Studies – Recent Results

### **Jorge R. Oksenberg, PhD**

University of California at San Francisco  
San Francisco, CA

Award: Research Grant

Term/Amount: 10/1/06-9/30/09; \$558,770

#### **“Family based genetic studies in ethnically distinct populations”**

In conjunction with an international team of genetics investigators, Jorge Oksenberg, PhD, and colleagues screened genetic material from hundreds of families with multiple members who have MS in search of MS susceptibility genes. The team reported exciting findings – read more at

<http://www.nationalmssociety.org/news/news-detail/index.aspx?nid=3113>.

### **Sergio Baranzini, PhD**

University of California at San Francisco  
San Francisco, CA

Award: Pilot Research Award

Term/Amount: 2/1/08-1/31/09; \$44,000

#### **“Regulation of gene expression in MS through the analysis of microRNA patterns”**

In this project, Sergio Baranzini, PhD, attempted to discover whether the types of proteins made by immune system cells known as “T cells” influence the transition of CIS (a single neurologic episode indicating high risk for MS) into full-blown MS. His group looked at a substance known as “microRNA”.

Recently discovered microRNA acts as a second method to control which proteins a cell makes, in addition to the long-known role played by the genes that are active in a cell. The team compared microRNA in the T cells of three groups: people with no symptoms of MS, people who have CIS that does not progress to MS, and people who have CIS that does develop into MS. Their results indicated that there is a set of microRNA unique to people with CIS, and this set differs between those who progress to MS and those who do not. These findings may contribute to better understanding of the events that lead to MS, possibly improving diagnosis and unveiling new treatment approaches.

### **Ariel Miller, MD, PhD**

Technion-Israel Institute of Technology  
Haifa, Israel

Award: Research Grant

Term/Amount: 10/1/04-9/30/09; \$589,569

#### **“Genetics of multiple sclerosis in the Israeli Arab population”**

Ariel Miller, MD, PhD, and colleagues attempted to detect MS genes in the Israeli Arab population. For genetic studies, there is an advantage to focusing on populations, like the Israeli Arabs, which mostly marry within their closed communities. By combining state-of-the-art genetic analysis and appropriate statistical methods, they attempted to identify gene alterations that are present in people with MS, and that might be more commonly found in association with certain MS symptoms. The team reports that they were able to recruit to this study more than 60% of the Arab people with MS in Israel, with the collaboration of several major Israeli MS clinics across the country, establishing a unique and well characterized set of samples that is an important source of information for this study, and for future studies as well. The team found that overall, the clinical characteristics of MS in Christian and Muslim Arabs are similar to those described among MS patients in Europe and North America. However, genetic tests for the HLA genes (genes involved in immune responses) revealed that the patient populations of Muslim and Christian Arabs appear to have a major difference in the forms of the HLA-DRB1 gene. A specific version of this gene that seems to be related to increased risk for MS in the Muslims, appeared to actually lower the risk for MS in Christian Arabs. These results have recently been published (Genes and Immunity 2010 May 13. [Epub ahead of print], <http://preview.ncbi.nlm.nih.gov/pubmed/20463743>). The team is continuing to enlarge the clinical and biosample database for the Israeli populations to foster additional research that can add to the information on how genes affect MS, and to learn about MS in Arab populations.

### **Christina Gurnett, MD, PhD**

Washington University

St. Louis, MO

Pilot Research Award: 5/1/08-4/30/09; \$44,000

### **“Genetic linkage analysis of a large Amish family with MS”**

Christina Gurnett, MD, PhD, and colleagues studied a large Amish family in which 10 members have MS. They screened 75 members of the family with an array of 10,000 DNA markers (DNA markers are like flags or sign posts that identify specific areas of the human genome that may contain a gene related to MS), looking for genes that differed between people with MS and family members. The team reported at the Annual Meeting of the American Society of Human Genetics that all but one individual with MS had at least one copy of the immune-regulating gene known as HLA DRB1\*1501. The team also identified two loci that, when inherited with HLA DRB1\*1501, were strong predictors of MS in this cohort. (Abstract #1853/F, <http://www.ashg.org/cgi-bin/2008/ashg08s?author=gurnett&sort=ptimes&sbutton=Detail&absno=20629&sid=203410>)