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Dr. Steve Schrodi's research focuses on two scientific areas: large-scale genetic studies of inflammatory diseases and theoretical genetics. His work combines experimental studies, statistical models, and the development of genetics theory. Dr. Schrodi completed his Bachelor's degree in genetics at the University of California – Davis and his Master's and doctoral degrees in biology at the University of California – Irvine where he researched theoretical population genetics. His previous research experience at Celera (Alameda, CA) emphasized the application of probabilistic methods to genome-wide association studies and mapping of autoimmune diseases.

CURRENT RESEARCH INTERESTS:

- Although inflammation is critical to proper response to infection and general immunocompetence, dysregulation of inflammatory pathways is a fundamental departure from homeostasis that underlies a wide variety of chronic and acute diseases. We are currently conducting a number of studies including Th17 cytokine signaling, mapping disease variants using extended kinships, inference of innate and adaptive immunity gene networks, the genetics of hyper-responsive lymphocytes, and the development of predictive models for immune-metabolic dysfunction. We are using molecular intermediate phenotype approaches in an attempt to better dissect the complexity of chronic

inflammatory diseases. The majority of our studies make use of the Personalized Medicine Research Project at the Marshfield Clinic Research Foundation. Understanding the inherited and acquired molecular aberrations that cause pathogenic inflammation will provide key insights for disease avoidance and remediation, potentially through the development of new targeted therapeutics

- Diseases studied include: Ankylosing Spondylitis, Psoriasis, Rheumatoid Arthritis, Multiple Sclerosis, Type 2 Diabetes, Autism, Host Susceptibility to Infectious Diseases, and Rare Immunological Diseases.
- Our theoretical and statistical work involves the development of probabilistic methods to analyze sequence data, the application of information theory metrics to quantify prognostic utility using molecular data, linkage disequilibrium patterns under disease models, and genetic properties of large founder populations.

OUTSIDE COLLABORATORS INCLUDE:

Judith A. Smith, M.D., Ph.D. – Department of Pediatrics, University of Wisconsin – Madison
Miriam Shelef, M.D., Ph.D. – Department of Medicine, Rheumatology Division, University of Wisconsin – Madison
Mark Leppert, Ph.D. – Department of Human Genetics, University of Utah
Norisada Matsunami, M.D., Ph.D. – Department of Human Genetics, University of Utah
Janet Lainhart, M.D. – Waisman Laboratory for Brain Imaging and Behavior, University of Wisconsin – Madison
Nicholas Lange, Sc.D. – Neurostatistics, McLean Hospital; Departments of Biostatistics and Psychiatry, Harvard Medical School
Mehdi Maadooliat, Ph.D. – Mathematics, Statistics and Computer Science, Marquette University
Naveen Bansal, Ph.D. – Mathematics, Statistics and Computer Science, Marquette University

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United States Patents Issued

- "Genetic polymorphisms associated with psoriasis, methods of detection and uses thereof", United States Patent 8975022; Filed Aug 12, 2012; Issued: Mar 10, 2015
- "Genetic polymorphisms associated with psoriasis, methods of detection and uses thereof", United States Patent 7993833; Filed Aug 31, 2007; Issued: Aug 9, 2011
- "Genetic polymorphisms associated with psoriasis, methods of detection and uses thereof" United States Patent 7947451; Filed: Dec 1, 2008; Issue: May 24, 2011
- "Genetic polymorphisms associated with rheumatoid arthritis, methods of detection and uses thereof", United States Patent 7863021; Filed: Sept 5, 2007; Issued: Jan 4, 2011
- "Genetic polymorphisms associated with rheumatoid arthritis, methods of detection and uses thereof", United States Patent 7833706; Filed: Jan 30, 2004; Issued: Nov 16, 2010

- "Genetic polymorphisms associated with psoriasis, methods of detection and uses thereof", United States Patent 9371565; Filed Jan 26, 2015; Issued: Jun 21, 2016

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