CIHR **STAGE**

Strategic Training for Advanced Genetic Epidemiology

Dr. Bhramar Mukherjee

Professor, Department of Biostatistics
School of Public Health
University of Michigan

Gene-environment interactions: new directions and novel applications

Friday
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12:00 – 1:00 pm

The Hospital for Sick Children
Daniels Hollywood Theatre
Room 1246, 1st Floor, Black Wing
555 University Avenue, Toronto, ON

Abstract: In this talk I will discuss the problem of analyzing gene-environment interaction (GEI) in longitudinal cohort studies. While the statistical literature on analyzing GEI in case-control studies is vast, the literature on longitudinal studies is limited. Several existing large cohort studies have collected genetic data in recent years and explored GEI from a hypotheses-driven pathway-based approach or an agnostic genomewide approach. We will consider two problems with repeated measures on quantitative traits over time, (a) characterizing time-varying contribution of the interaction term and (b) to develop multi-marker pathway-based tests for interaction instead of single SNP analysis. We will propose two novel statistical approaches to handle these two problems. The methods will be illustrated by data from the Normative Aging Study (NAS) of Boston area veterans and the Multi-Ethnic Study of Atherosclerosis (MESA). We will conclude with a discussion of what we need to do better in order to characterize reproducible and believable GEI in terms of both design and analysis of future studies.

Profile: Bhramar Mukherjee is currently a Professor of Biostatistics at the School of Public Health, University of Michigan. She did her Ph.D in Statistics from Purdue University in 2001. She was an Assistant Professor of Statistics at the University of Florida from 2002-2006, before coming to Michigan. Her research interests are gene-environment interactions, Bayesian methods in genetic and environmental epidemiology and statistical analysis under outcome dependent sampling. Dr. Mukherjee has authored more than one hundred articles in reputed Statistics, Biostatistics and Epidemiology journals. She is leading multiple NIH and NSF grants on gene-environment interaction analysis as principal investigator. She is the director of Biostatistics core in two large center grants related to environmental health. She is an elected member of the International Statistical Institute and is a fellow of the American Statistical Association. She is a member of the University of Michigan Comprehensive Cancer Center and Associate Director of the Cancer Biostatistics Training Grant. She has won multiple awards for her teaching accomplishments including the 2012 School of Public Health Excellence in Teaching Award at University of Michigan.

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