



The University of Chicago
Department of Statistics
Seminar Series

*This is a joint talk sponsored by the Department of Statistics
and the Ben May Department for Cancer Research*

BENJAMIN RAPHAEL

Department of Computer Science
and Center for Computational Molecular Biology
Brown University

**Characterization of Somatic Mutations
in Cancer Genomes**

FRIDAY, January 14, 2011, at 12:00 PM

GCIS W301-303, Gordon Center for Integrative Science, 929 East 57th Street

ABSTRACT

Cancer is a disease driven by somatic mutations that accumulate in the genome during an individual's lifetime. Recent advances in DNA sequencing technologies are enabling the measurement of these mutations in many cancer samples. However, distinguishing functional driver mutations responsible for cancer from random passenger mutations remains a challenge. We develop two mathematical models to address this challenge. These models rely on the observation that driver mutations target a relatively small number of signaling and regulatory networks in the cell. In the first model, we use a diffusion process on graphs and a novel statistical test to identify groups of interacting genes, or pathways, that are mutated in a significant number of cancer samples. In the second model, we use a Markov Chain Monte Carlo approach to identify groups of genes whose mutations are mutually exclusive (or nearly so) in a large number of samples. I will illustrate applications of our approaches to real mutation data from The Cancer Genome Atlas.

This is joint work with Fabio Vandin and Eli Upfal from Brown University.

For further information and about building access for persons with disabilities, please contact Laura Rigazzi at 773.702.8333 or send email (lrigazzi@galton.uchicago.edu). If you wish to subscribe to our email list, please visit the following web site: <https://lists.uchicago.edu/web/info/statseminars>.