



DEPARTMENT OF BIOSTATISTICS COLLOQUIUM 2011-2012

The Levin Lecture Series

Thursday, December 8, 2011, Informal Tea, 3:40PM, talk, 4-5PM

MSPH, 722 West 168th Street, Biostatistics Computer Lab, Room 656



Dr. Jay Bartroff, Ph.D.

Department of Mathematics, University of Southern California

<http://www-bcf.usc.edu/~bartroff/>

Efficient Phase I-II Designs Using Sequential Generalized Likelihood Ratio Statistics

Abstract: We focus on the following scenario in early phase cancer trials. Following a Phase I trial in which the maximum tolerated dose (MTD) η of a treatment is estimated, a Phase II trial tests the hypothesis $H_0 : p \leq p_0$, where p is the probability of efficacy at the estimated MTD $\hat{\eta}$ from Phase I and p_0 is the baseline efficacy rate. Standard practice for Phase II remains to treat $p = p(\hat{\eta})$ as a fixed, unknown parameter and to use Simon's (1989) 2-stage design with all patients dosed at $\hat{\eta}$. In this talk we propose an alternative approach utilizing sequential generalized likelihood theory which accounts for the uncertainty in $\hat{\eta}$, uses both efficacy and toxicity data from both phases, does not require that all patients to be dosed at $\hat{\eta}$, and allows updating of $\hat{\eta}$ both during and after Phase II. Efficient group sequential sampling, or even adaptive sampling, can be used within this framework, which allows for early stopping to show treatment effect or for futility. The results of simulation studies will be shown comparing this proposed design to current practice. This is joint work with Tze Lai and Balasubramanian Narasimhan at Stanford.

Biographical Notes: Dr. Bartroff received his Ph.D. in mathematics from Caltech in 2004 and is currently Assistant Professor in the Department of Mathematics at USC. From 2004-2007 he was a postdoctoral fellow in Statistics at Stanford University where he was a member of the Stanford Medical School's Cancer Center Biostatistics Core, through which he was involved in the design and analysis of cancer clinical trials. Dr. Bartroff's methodological research concerns sequential estimation, analysis, and design, particularly with applications to the design and analysis of complex clinical trial data. He is the author of numerous articles on statistics and probability and has a forthcoming book from Springer titled "Sequential Experimentation in Clinical Trials: Design and Analysis."