



The University of Chicago
Department of Statistics
Master's Seminar

BROOKE SOWELL

Department of Statistics
The University of Chicago

“Estimating the Recovery Kinetics of tER Sites”

**WEDNESDAY, July 27, 2005 at 10:00 am
110 Eckhart Hall, 5734 S. University Avenue**

ABSTRACT

The transitional Endoplasmic Reticulum (tER) site is a small spot on the Endoplasmic Reticulum that proteins must pass through on their way from the ER to the Golgi apparatus. Through fluorescence recovery after photobleaching (FRAP) imaging techniques the rate proteins attached to specific genes transfer between tER sites is observable, allowing one to infer protein kinetics and behaviors. It is important to estimate a function accurately describing the recovery kinetics of proteins connected to specific genes while accounting for measurement errors inherent in the imaging process. Using nonlinear least squares methods the parameters governing the function describing the recovery process are estimated. This enables the comparison of half time recovery rates between different genes or of proteins attached to the same gene but under different cellular conditions. The purpose of this paper is to approximate a function describing the half time recovery of a specific tER site.