



QBiC SEMINAR

Speaker

Samuel Issacson, Ph.D.

Department of Mathematics and Statistics, Boston University

Date &
Location

Wednesday, July 30, 2014 14:00 - 14:45

OLABB 1F Lounge

(6-2-3, Furuedai, Suita, Osaka 565-0874)

*There will be a video broadcast in CDB Bldg.D, E-206

Title

**Influence of Sub-Cellular Structure on the
Dynamics of Cellular Processes**

Abstract

We will describe our work investigating how sub-cellular structure can influence the dynamics of cellular processes. We will first examine how volume exclusion due to the spatially varying density of DNA in the nucleus may influence the time required for proteins to find DNA binding sites. Detailed three-dimensional simulations of the protein's search process will be constructed, incorporating chromatin density fields determined by several different types of high-resolution images of the interior of mammalian cell nuclei. Using asymptotic expansions, we will develop a mathematical theory to explain our observed simulation results.

Time-permitting, we will discuss recent work investigating how volume exclusion due to organelles within the cytosol can influence the time required for signals to propagate from the cell membrane to the nuclear membrane.

Host

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