UCLA

BIOMATH

Department of Biomathematics Seminar Series:
Frontiers in Systems and Integrative Biology

The Dynamics of Fibrin Gel Formation

James P. Keener, Ph.D.
Distinguished Professor of Mathematics
Adjunct Professor of Bioengineering
University of Utah

Thursday, March 27, 2014
4:00 PM
13-105 Center for the Health Sciences (CHS)

ABSTRACT:
Biogels are complex polymeric networks whose proper function is important to many physiological processes. For example, the proper function of mucus gel is important for airway clearance, reproduction, digestion, gastric protection, and disease protection and its failure is involved in cystic fibrosis, gastric ulcers, and reproductive dysfunction. Fibrin clots are crucial for prevention of bleeding after injury but inappropriate formation of clots is implicated in hearts attacks and strokes.

There are three phases of biogel dynamics that are important to their biological function. These are their formation (i.e., blood clotting), degradation (clot dissolution), and swelling/deswelling kinetics (during mucin secretion/exocytosis, for example).

The purpose of this talk is to describe recent advances in the study of the dynamics of fibrin clot formation. In particular, I will derive and discuss features of a new partial differential equation model that describes the growth of fibrin clots as a polymerization/gelation reaction. The solution of this PDE model gives insight into the branching structure of clots that are formed under various physiological conditions.

Host: Tom Chou, Ph.D.

To receive e-mail seminar notices, contact David Tomita (dtomita@biomath.ucla.edu)