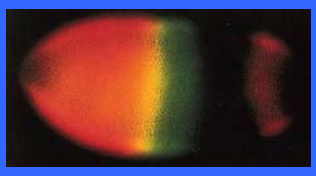
Institute for Pure and Applied Mathematics
University of California, Los Angeles presents

Cells and Materials III: Angiogenesis, NeoVascularization and Morphogenesis

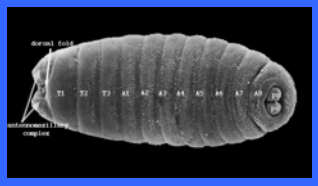
May 8 - 12, 2006

Members of the Organizing Committee include **Luisa Iruela-Arispe** (UCLA, Mol, Cell & Dvlmt Bio), **Trachette Jackson** (University of Michigan, Mathematics), **Howard Levine** (Iowa State University, Mathematics), **John Lowengrub** (University of California at Irvine, Mathematics), **Sharon Lubkin** (N Carolina State University, Mathematics/Statistics), **Bill Tawil** (Baxter Biosciences, BioSurgery)

Background and Motivation:



The development and life-cycles of all living beings are characterized by striking changes in morphology ranging from cell-differentiation to organ development. Morphogenesis occurs in response to gradients of morphogens whose concentrations determine the pathway cells will take during development. Angiogenesis and neovascularization are a specific example of morphogenesis and describe the recruitment and proliferation of vascular endothelial cells from the existing vascular system in order to develop a new vascular network that provides blood and nutrients to specific tissues. Angiogenesis occurs during the natural course of wound healing and tissue regeneration as well as in fetal development. A pathological form of angiogenesis occurs during tumor growth and the resulting neovasculature is much more leaky than is normally the case. Thus, during tissue regeneration it is desirable to promote angiogenesis while during tumor growth angiogenesis should be suppressed. Angiogenesis involves a number of biochemical and biophysical pathways that have been extensively studied experimentally although there is still much more work to be done. Mathematical modeling, analysis and numerical simulations of angiogenesis are the subject of current research efforts. In this program, we will bring together experts to discuss the state-of-the-art of this field.



The overall structure of the workshop will be as follows:

Day 1: Foundations of Angiogenesis (Tutorials)
Day 2: Angiogenesis and Development
Day 3: Angiogenesis and Wound Healing
Day 4: Angiogenesis and Tumor Growth
Day 5: Analogies with Neuronal Development

Mathematical approaches: Equations of reaction-diffusion-chemotaxis, stochastic processes, percolation, numerical simulations

Participation:

We have funding to support the attendance of recent PhD's, graduate students and researchers in the early stages of their career. Mathematicians and scientists at all levels who would like to learn more about this area are encouraged to apply for funding. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission and we welcome their applications.

https://www.ipam.ucla.edu/elements/choose.aspx?pc=cmws3

or email questions to ***cmws3@ipam.ucla.edu***
IPAM is an NSF funded Institute