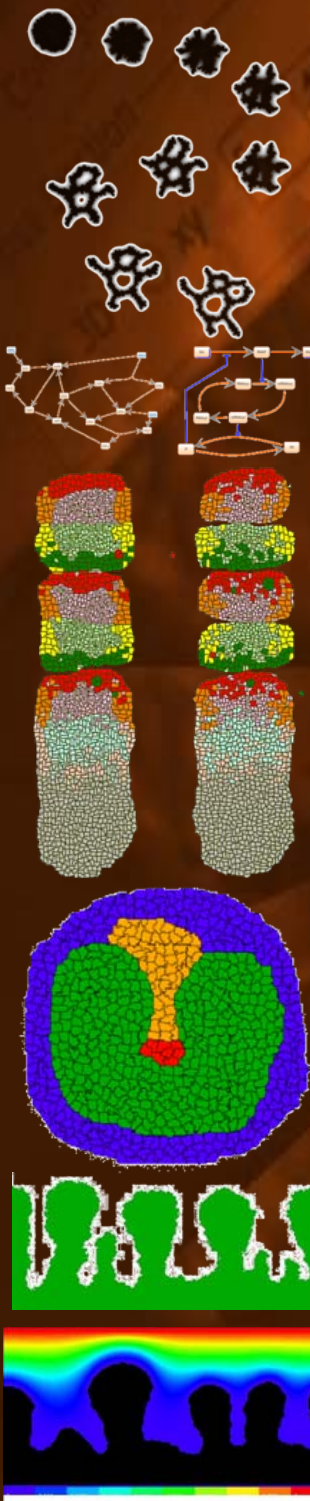


# Joint Training Workshop

## Developing Multi-Scale, Multi-Cell Developmental and Biomedical Simulations with CompuCell3D and SBW

August 8th-19th 2011

Indiana University, Biocomplexity Institute, Bloomington, IN, USA



**Background:** Modeling is becoming an integral part of contemporary bioscience. The Glazier-Graner-Hogeweg (GGH) model as implemented in the modeling environment, CompuCell3D allows researchers to rapidly build complex models of multi-cell processes in development and disease with user-selectable resolution, from sub-cellular compartmental models to continuum models of tissues. To efficiently link to sub-cellular scale users build biochemical reaction models using SBW and use exported models in the SBML format to control properties of simulated cells in CompuCell3D. CompuCell3D and SBW are simulation environments that target complementary areas of biological modeling. By combining the capabilities of both frameworks users can build truly multi-scale models of tissues, organs or organisms with minimal amount of hardcoded, heuristic rules. CompuCell3D and SBW are open source, allowing users to extend, improve, validate, modify and share the core software. For more information please visit: <http://www.compuCell3d.org/> (CompuCell3D and GGH) or <http://www.sys-bio.org/> (SBW)

**Goal:** By the end of the two week course, participants will have implemented a basic simulation of the particular biological problem they work on. Post-course support and collaboration will be available to continue simulation development.

**Topics:** Introduction to Reaction-Kinetics (RK) models. Introduction to SBW, Simulation, Network design tools and SBML. Introduction to GGH modeling. Applications of GGH modeling. Introduction to CompuCell3D. Python scripting. Basics of model building. Extending CompuCell3D. Building a basic simulation of your system.

**Format:** The workshop will consist of a limited number of lectures and extended hands-on computer tutorials. Each attendee will present a 30 minute lecture on her/his field of research.

**Instructors:** Herbert Sauro, James A. Glazier, Maciej Swat, Randy Heiland, Abbas Shirinifard (Indiana University)

**Target Audience:** Experimental Biologists, Medical Scientists, Biophysicists, Mathematical Biologists and Computational Biologists from advanced undergraduates to senior faculty, who have an interest in developing multi-cell, multi-scale computational models, or learning how such models might help their research. No specific programming or mathematical experience is required, though familiarity with some modeling environment (e.g. Mathematica®, Maple®, Matlab®) and how to represent basic concepts like diffusion and chemical reactions mathematically, would be helpful.

**Fees and Support:** There is no registration fee and partial support for travel and hotel costs may be available. We will provide lunches and workshop materials.

**Application and Registration:** Enrollment is limited and by application only. To apply, please send a c.v., a brief statement of your current research interests and of the specific problem you would like to model. Students and postdocs should also include a letter of support from their current advisor. If travel support is being requested, please include a statement documenting need and amounts requested. Please submit all application materials electronically to Maciej Swat (mswat@indiana.edu) by June 1st, 2011.

**Facilities:** Participants will have access to an OSX cluster and will be able to connect to the Internet using their own laptops.

**For More Information, Please Contact:** Maciej Swat (mswat@indiana.edu).

**Or visit:** [www.compuCell3d.org](http://www.compuCell3d.org)

Supported and funded by:

