

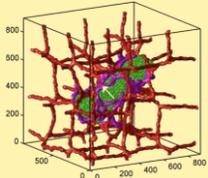


# 2020 Multicell Virtual Tissue Modeling ONLINE Summer School & Hackathon

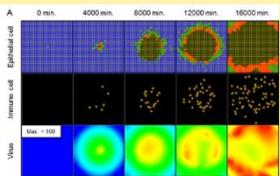
Summer School: August 3<sup>rd</sup> – 6<sup>th</sup>, 2020 (Monday – Thursday)

Model-Building Hackathon: Aug. 7<sup>th</sup> – 9<sup>th</sup>, 2020 (Friday – Sunday)

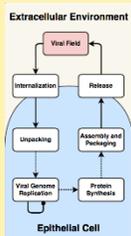
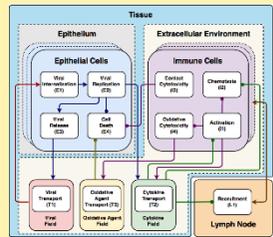
Indiana University, Bloomington, IN, USA



Vascular Tumor Growth



Viral Infection Modeling



Biochemical Networks  
and Viral Replication  
Modeling



Cell Migration  
Modeling

Supported and funded by:

**Background:** Mechanistic modeling is an integral part of contemporary bioscience, used for hypothesis generation and testing, experiment design and interpretation and the design of therapeutic interventions. The CompuCell3D modeling environment allow researchers with modest programming experience to rapidly build and execute complex Virtual Tissue simulations. Motivated by the current SARS-CoV-2 pandemic, we will use the modeling of the spread of viral infection and immune cell response in a tissue to teach techniques which also apply to development, homeostasis, toxicology, cancer and developmental diseases and tissue engineering.

**Goal:** By the end of summer school and hackathon, participants will have implemented a basic simulation of their particular biological problem of interest. Post-course support and collaboration will be available to continue simulation development

**Topics:** Python scripting. Introduction to Virtual-Tissue simulations. Modeling infection, immune response, tissue damage and recovery in a tissue. Extending CompuCell3D. Building a basic simulation of your system of interest.

**Format:** Daily video tutorial (asynchronous) with live zoom support & daily group discussion sections (zoom).

Summer school will be four days of lectures & hands-on computer tutorials. This will be immediately followed by a modeling hackathon in which teams of advanced and beginner modelers develop research-grade models of biological systems. Participants will be able to further customize models with their own data and publish.

**Instructors:** James A. Glazier (Indiana University), Julio Belmonte (North Carolina State University), Maciek Swat, Juliano Gianlupi (Indiana University), Andy Somogyi (Indiana University), James Sluka (Indiana University), Gilberto L Thomas (UFRGS), Bobby Madamanchi (Purdue University) and Dr. T. J. Sego (Indiana University, CompuCell3D lead developer).

**Target Audience:** Experimental Biologists, Medical Scientists, Biophysicists, Mathematical Biologists and Computational Biologists from advanced undergraduates to senior faculty, who want to develop multi-scale Virtual-Tissue simulations, or learn how such simulations might help their research. No specific programming or mathematical experience is required.

**Fees:** There is no registration fee.

**Registration:** Enrollment is limited and by application only. Kindly apply online at <https://bit.ly/2UOA8XI> with a c.v., a brief statement describing your current research interests and the specific problem you would like to model. Students should also include a letter of support from their current advisor. Please submit all application materials by **June 15<sup>th</sup>, 2020**.

**For more information:** Try out the tissue infection model, please visit <https://nanohub.org/resources/cc3dcovid19> (free, but registration required), Email: [compuCell3d.iu@gmail.com](mailto:compuCell3d.iu@gmail.com) | twitter: @compuCell3d | website: [www.compuCell3d.org](http://www.compuCell3d.org)

