Tutors

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How to get here:

University Stuttgart Research Centers are faculty-independent institutions supplementary to the existing faculty structures devoted to interdisciplinary research fields at the interface between classical disciplines.

*In order to enforce systems biology research at the University of Stuttgart, the **Stuttgart Research Center Systems Biology (SRCSB)** was established in 2013 and started its activities in January 2014. SRCSB is the follow-up organization of the previous Center Systems Biology (CSB), founded already in 2006.*

The mission of the SRC Systems Biology is to develop, establish and sustain new structures that allow integrated research and education across disciplines in the field of systems biology. It is the aim of SRCSB to promote understanding of complex biological processes and systems through a well-balanced approach of linking data driven modelling and model driven data acquisition. The present SRCSB research is closely linked to the two main research areas of life sciences at University Stuttgart, industrial and medical biotechnology.

The SRCSB is responsible for the coordination of interfaculty research projects and provides a platform for participating institutes and research groups to realize an active interdisciplinary exchange of ideas and to promote joint project work of experimental, modelling and simulation groups.

Tutorial

SRCSB University of Stuttgart
STUTTGART RESEARCH CENTER SYSTEMS BIOLOGY

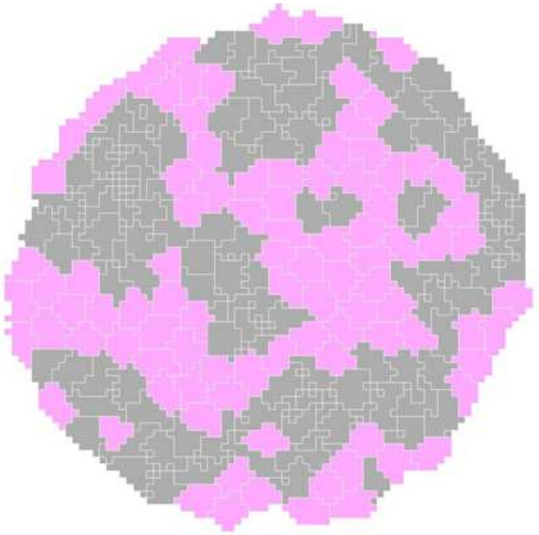
Multiscale, Cell-based Modelling in Biological Development and Cancer

October 09 -10, 2014

Venue:

University of Stuttgart
Pfaffenwaldring 6
Room 0.24
70569 Stuttgart-Vaihingen

University of Stuttgart
Germany



The image shows a cell-sorting example simulated in CompuCell3D.

This tutorial will give an introduction and some hands- on experience in multiscale, cell - based modelling of biological tissues.

We will discuss the key role of multiscale feedback loops in developmental biology (e.g. in cell sorting, tumour development), and in tumour biology. It will then be shown, using simple, hands-on examples, how computational, cell-based modelling helps to analyse multiscale feedback loops. After discussing a range of cell-based modelling techniques, the hands-on examples will work with the Cellular Potts model (CPM) and the software package CompuCell3D.

Teaching Materials

CompuCell3D
Documentation can be found at www.compucell3d.org/Manual.
Python
Python is very useful when working with CompuCell3D. More information on python can be found at wiki.python.org/moin/BeginnersGuide/Programmers.

Solutions

Solutions to exercises etc. will be published shortly after the tutorial date.

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Thursday, October 09, 2014

10:00 – 10:45	**Matthias Reuss**: Multiscale, Cell-based Modelling in Biological Development and Cancer
11:00 – 11:45	**Maciek Swat**: Multi-Cell Approaches to Virtual Tissues
11:45 – 13:00	Lunch
13:00 – 16:30	**Hands-on experience**: Introduction to Cell-Sorting in CompuCell3D

Friday, October 10, 2014

10:00 – 10:45	**Roeland Merks**: Cell-based modelling of blood vessel development: mechanical cell-cell communication, lumen formation, and tip-stalk cell interactions
11:00 – 11:45	**Holger Perfahl**: Multiscale Modelling of Angiogenesis and Vascular Tumour Growth
11:45 – 13:00	Lunch
13:00 – 16:30	**Hands-on experience**: Multicellular Spheroid Growth with Application of a TRAIL Therapy
	Summary and Discussion