NIMBioS Tutorial: Mathematical Modeling for the Cell Biology Researcher and Educator Agenda

Monday, April 8

8:10-8:45 **Breakfast** at NIMBioS

8:45-9:00 **Welcome** by Suzanne Lenhart, NIMBioS Associate Director for Education & Outreach

9:00-9:30 **Introduction** of tutors and participants (Holmes)

9:30-10:30 **Lecture**: Introduction to kinetic modeling (Blinov)

10:30-10:45 **Coffee break**

10:45-12:00 **Lecture & Tutorial**: Reaction-diffusion modeling & Modeling with VCell (Loew)

12:00-1:00pm **LUNCH**

1:00 -2:30 **Modeling tutorial** using VCell (Loew)

- Reaction network basics
- Cell geometry: compartmental, analytic and image-based
- Deterministic and stochastic simulations
- Spatial simulations: partial differential equations & particle-based

2:30-3:00 **Coffee break** & **Introduction** of projects by participants (Raquell & Les)

3:00-5:00 **Hands-on session**: parallel tracks

   Room 1: Modeling basics for biological problems.

   Room 2: Assistance with participants' modeling projects.

5:00-6:00pm **Reception and poster session** (All)

7:30-9:00pm **Optional Q&A session** (All)

Tuesday, April 9

8:10-8:45 **Breakfast** at NIMBioS

8:45-9:45am **Lecture**: Databases and standards (Mi)

9:45 -10:45 **Tutorial:** Panther-SBML (Mi)

10:45-11:00 **Coffee break**

11:00-12:30 **Lecture:** Rule-based modeling (Blinov)

12:30-1:30 **LUNCH**

1:30-2:45 **Tutorial**: Pathway component and rule-based modeling with VCell, SBML import (Blinov)

2:45-3:45 **Lecture:** Integrating modeling into curriculum (Holmes, Borinskaya)

3:45-4:00 **Coffee break**

4:00-6:00 **Hands on session**: parallel tracks

   Room 1: Modeling basics exercises with Rule-based modeling and databases.

   Room 2: Assistance with participants' modeling projects.

7:30-9pm **Optional Q&A session**

Wednesday, April 10

8:10-8:45 **Breakfast** at NIMBioS

8:45-9:45 **Discussion**: Use of software, modeling resources for education (teaching modules, wiki)

10:00-11:00 **Lecture**: Overview of different software tools and databases, such as CellDesigner, Copasi, SBGN drawing tools, BioNumbers, NFSim, Kappa, MCell, Cytoscape (Blinov)

11:00 -12:00pm **Informal presentations and feedback session**

12:00-1:00 **LUNCH**