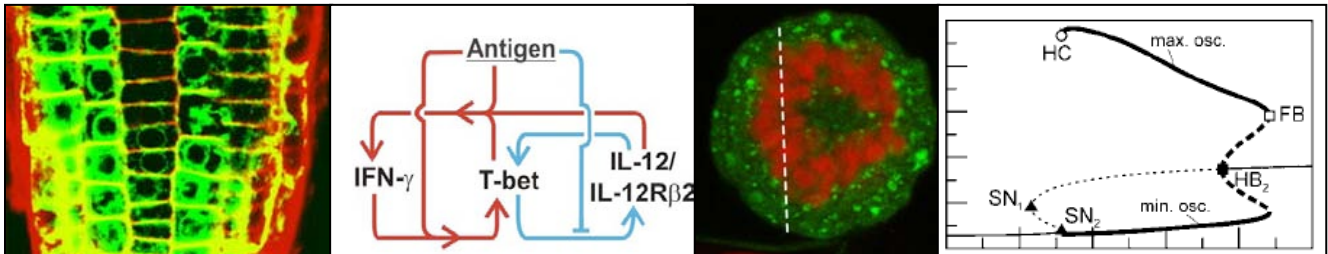# Summer School:
Mathematical Modeling in Cell Biology
June 10-12, 2009, BioQuant Center, Heidelberg

Speakers:

- Grégoire Altan-Bonnet, Memorial Sloan-Kettering Cancer Center, New York
- Lutz Brusch, University of Dresden
- Utz-Uwe Haus, Research Center Dynamic Systems/MaCS, University of Magdeburg
- Thomas Höfer, DKFZ and BioQuant, Heidelberg
- Dagmar Iber, ETH Zürich, Department of Biosystems Science and Engineering, Basel
- Ursula Kummer, University of Heidelberg
- Jon Lindquist, Utz-Uwe Haus, University & ForSys Center Magdeburg
- Nick Monk, Centre for Integrative Systems Biology, University of Nottingham
- Francois Nédélec, European Molecular Biology Laboratory, Heidelberg
- Karsten Rippe, DKFZ and BioQuant, Heidelberg

Organized by:

EU-FP7 Network Systems Biology of T cell Activation (SYBILLA)

ViroQuant / BioQuant

Helmholtz Alliance on Systems Biology / SBCancer

Program

Wednesday, June 10

<u>Cell-Fate Decisions and Spatio-Temporal Patterning</u>

09:00-10:00   Registration

10:00-11:00   **Nick Monk, University of Nottingham**
"Modelling the assignment of cell fates in the Arabidopsis root epidermis"

11:00-11:30   *Coffee break*

11:30-12:30   **François Nedelec, EMBL Heidelberg**
"Simulation the organization of cytoskeletal fibers"

12:30-13:00   Thomas Höfer, German Cancer Research Center
Introduction: "Mathematical modeling in cell biology"

13:00-14:00   *Lunch*

14:00-15:00   **Ursula Kummer, University of Heidelberg**
"Modeling, simulation and analysis of biochemical systems with COPASI"

15:00-16:00   **Lutz Brusch, University of Dresden**
"Interacting GTPases dynamically establish intracellular membrane identities"

16:00-16:30   *Coffee break*

16:30-17:30   **Discussion with speakers**

17:30-18:30   **Short talks**

17:30-17:45   Kevin Thurley, Max-Delbrück Centrum für molekulare Medizin Berlin
"A new method permits analytic treatment of stochastic systems with spatial organization"

17:45-18:00   Andrew Angel, John Innes Centre, Norwich
"Modelling the epigenetic dynamics of vernalization"

18:00-18:15   Antonio Politi, University of Auckland
"A multiscale, spatially-distributed model of asthmatic airway hyper-responsiveness"

18:15-18:30   Saul Hazledine, John Innes Centre, Norwich
"Parameter estimation of chaotic systems"

19:30-   *Speakers' dinner*

Thursday, June 11

<u>Signaling in the Immune System</u>

09:00-10:00   **Grégoire Altan-Bonnet, Memorial Sloan-Kettering Cancer Research Center, New York**
"System immunobiology: How integrated cytokine regulation enforces self/non-self discrimination in the immune system"

10:00-10:30   *Coffee break*

10:30-11:30   **Jon Lindquist, University & ForSys Center, Magdeburg**
"Modeling T-cell activation"

11:30-12:30   **Short talks**

11:30-12:00   Carsten Watzl, University of Heidelberg
"Decision making in natural killer cells""

12:00-12:15   Luca Mariani, Humboldt University Berlin:
"Il-4 expression in Th2 cell differentiation: probabilistic regulation, epigenetic control and short-term memory"

12:15-12:30   Aida Mehonic, University College London
"Computational modelling of cell-cell boundary dynamics in an epithelium comprising two distinct cell types"

12:30-13:30   *Lunch*

13:30-14:30   **Utz-Uwe Haus, University of Magdeburg**
"Boolean models for cellular signaling: Construction, falsification and selecting dynamic alternatives"

14:30-15:00   *Coffee break*

15:00-16:00   **Discussion with speakers**

16:00- 22:00   *Boat trip (Heidelberg – Neckarsteinach) and Dinner*

Friday, June 12, 2009

<u>Chromatin-Associated Processes</u>

09:00-10:00   **Dagmar Iber, ETH Zürich**
"Models of cell fate decisions"

10:00-10:30   *Coffee break*

10:30-11:30   **Karsten Rippe, German Cancer Research Center**
"Determination of protein mobility and interaction parameters in living cells by fluorescence fluctuation microscopy"

11:30-12:30   **Thomas Höfer, German Cancer Research Center**
"Modeling the assembly and function of chromatin-associated multiprotein complexes"

12:30-13:30   *Lunch*

13:30-14:30   **Discussion with speakers**

14:30   Concluding remarks / End of workshop
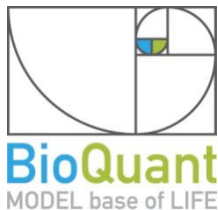
Further Information:

For further information visit
http://www.dkfz.de/en/sbcancer/modeling-school2009.html

Organization and Funding by: