

Ursula Kummer

Professor
Modeling of Biological Processes
University of Heidelberg

Phone: ++49-(0)6221-54 51278

Fax: ++49-(0)6221-54 51483

Email: ursula.kummer@bioquant.uni-heidelberg.de

URL: <http://www.bioquant.uni-heidelberg.de/research/groups>

Recent Positions

2007-present Professor, Modelling of Biological Processes, Faculty of Biosciences
University of Heidelberg

2003-present Co-Coordination of BIOMS (Center for Modeling and Simulation)

2000-2007 Group leader at EML Research, Heidelberg

Research Interests:

The newly founded department at the University of Heidelberg headed by Ursula Kummer focuses on the development of methods for the simulation, modelling and analysis of biochemical networks as well as on the application of these methods to tackle specific biochemical questions. The software Copasi (Complex Pathway Simulator) developed together with the group of Dr. Pedro Mendes which allows the simulation, modelling and the analysis of biochemical network is internationally widely used. Examples for applications include the study of calcium signaltransduction and information processing therein and the activation of human neutrophilic leukocytes (with Lars Folke Olsen, Odense, Denmark and Howard Petty, Michigan, USA). Ursula Kummer's group is member of the EU NoE BioSim which targets at the pharmaceutical use of modeling and simulation in the biosciences.

Selected Publications::

- U. Kummer, J. Zobeley, J. C. Brasen, R. Fahmy, A. L. Kindzelskii, A. R. Petty, H. R. Petty: *Elevated Glucose Concentrations Promote Receptor-Independent Activation of Adherent Human Neutrophils: An Experimental and Computational Approach*, Biophys. J., in press.
- U. Kummer, B. Krajnc, J. Pahle, M. Marhl: *Transition from Stochastic to Deterministic Behaviour in Calcium Oscillations*, Biophys. J. 89, 1603-1611 (2005).
- A. Z. Larsen, L. F. Olsen, U. Kummer: *On the Encoding and Decoding of Calcium Signals in Hepatocytes*, Biophys. Chem. 107, 83-99 (2004).
- J. Zobeley, D. Lebiedz, J. Kammerer, A. Ishmurzin, U. Kummer: *A New Time-Dependent Complexity Reduction Method for Biochemical Systems*, Trans. Comp. Systems Biol. (Lecture Notes in Computer Science) 1, 90-110 (2004).
- L. F. Olsen, U. Kummer, A. L. Kindzelskii, H. R. Petty: *A Model of the Oscillatory Metabolism of Activated Neutrophils*, Biophys. J. 84, 69-81 (2003).
- L. F. Olsen, M. J. B. Hauser, U. Kummer: *Mechanism of Protection of Peroxidase Activity by Oscillatory Dynamics*, Eur. J. Biochem. 270, 2796-2804 (2003).
- R. G. Gabdouliline, U. Kummer, L. F. Olsen, R. C. Wade: *From Molecular Structure to Cellular Oscillations by Combining Simulation Techniques* Biophys. J. 85, 1421-1428 (2003).
- U. Kummer, L. F. Olsen, C. J. Dixon, A. K. Green, E. Bornberg-Bauer, G. Baier: *Switching from Simple to Complex Oscillations in Calcium Signalling*, Biophys. J. 79, 1188-1195 (2000).
- U. Kummer, G. Baier: *A Dynamic Enzymatic Switch*, J. Phys. Chem. 102, 5892-5897 (1998).
- U. Kummer, M. Hauser, K. Wegmann, L. F. Olsen, G. Baier: *Oscillations in the Peroxidase-Oxidase Reaction Induced by Artificial and Naturally Occuring Phenols*, J. Am. Chem. Soc. 119, 2084-2087 (1997).