



EINLADUNG

zum

ZIH-Kolloquium

Titel: A continuous model of cell adhesion: Modelling, simulation and application

Referent: Dr. Alf Gerisch
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Abstract:

Cellular adhesion is a key factor in many biological processes. Interactions of adhesion molecules at the molecular scale lead to cell rearrangements at the cellular scale and these may generate macroscopic patterns at the tissue scale.

A multitude of discrete and continuous models of cell adhesion have been proposed which take into account effects at the various scales. Following a brief review of such models, the continuous model of cell adhesion [N.J. Armstrong et al. (2006) J. Theor. Biol., 243:98-113] is discussed in more detail. This model captures molecular and cellular scale effects in an integral (non-local) term defining a cell velocity due to adhesive effects. This velocity is then employed to drive rearrangements of cell densities at the tissue scale in an advection-diffusion-reaction system. The application of this framework to successfully model effects as observed in cell sorting experiments and cancer cell invasion demonstrates the suitability and generality of the approach. The talk will also focus on numerical challenges in the simulation of the model equations and outline possible extensions of the framework.

Ort: Willers-Bau A 220

Zeit: Mittwoch, 27. Mai 2009, 14:00 Uhr

gez. Prof. Dr. Wolfgang E. Nagel