



**EINLADUNG**  
**zum**  
**ZIH - KOLLOQUIUM**

**Title: Models for highly dynamic intracellular pattern formation**

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**Abstract:**

Pattern formation in single cells requires the generation of local concentration maxima at the cell cortex. Patterning within a single cell imposes several constraints that are different from those in multicellular systems. Arguments will be given that intracellular patterning usually depends on a self-enhancing accumulation of molecules at the membrane, which is antagonized by a depletion of precursor molecules or a co-factor from the cytoplasm. Pattern formations with a membrane – cytoplasm geometry have some properties distinct from a patterning within a cell sheet. Patterning systems of the activator-inhibitor type are inconvenient. Many of the intracellular patterns are characterized by a highly dynamic behaviour that never leads to a stable steady state. The stretching out of pseudopods in chemotactic cells and the pole-to-pole oscillation of MinD in E.coli belong to this category. These patterns can be explained by assuming that newly formed maxima at the cell membrane trigger secondary processes that cause a quenching of these maxima. This can lead either to a shift into an adjacent region, to their disappearance and re-appearance at an updated position or to a split into two maxima with a subsequent dominance of one. Computer simulations will be provided and compared with observations made in different systems on the molecular-genetic level.

**Ort: Informatik-Neubau, Nöthnitzer Str. 46, Großes Ratszimmer 1004**

**Zeit: Montag, den 26. April 2010, 14:00 Uhr**

**gez. Prof. Dr. Wolfgang E. Nagel**