TECHNISCHE UNIVERSITÄT DRESDEN

Zentrum für Informationsdienste und Hochleistungsrechnen

EINLADUNG

zum

ZIH-Kolloquium

Titel: **Unraveling the mechanisms of glioma tumor invasion**

Referent: **Dr. Haralambos Hatzikirou**
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Abstract:

Invasion of malignant glioma tumors is typically very aggressive and a highly complex phenomenon involving molecular and cellular processes at various spatio-temporal scales, whose precise interplay is still not fully understood. In order to identify the cellular mechanisms of glioma tumor invasion, we study an in vitro culture of glioma cells from the literature. By means of a computational approach based on a cellular automaton model, we compare theoretical results to the experimental data and deduce microscopic interactions (cellular mechanisms) from microscopic and macroscopic observables (experimental data). In particular, for the first time, it is theoretically shown that the migration/proliferation dichotomy plays a central role in the invasion of glioma cells. Additionally, we observe that radial persistence of glioma cells nearby dense areas accelerates the invasion process. We argue that persistence may result from a cell-cell repulsion mechanism. When glioma cell behavior is regulated through a migration/proliferation dichotomy and a self-repellent mechanism, our mathematical model reproduces faithfully the experimental observations.

Ort: **Informatik-Neubau, Nöthnitzer Str. 46, INF 1005**
Zeit: **Donnerstag, 17. Dezember 2009, 14:00 Uhr**

gez. Prof. Dr. Wolfgang E. Nagel