**Density-dependent quiescence phases in glioma cell migration**

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Gliomas are very aggressive brain tumors, in which tumor cells gain the ability to invade the surrounding normal tissue. This type of brain tumor comprises an extremely interesting paradigm of invasive tumor, where its dynamics and mechanisms are not yet fully understood. Our work is motivated by the migration/proliferation dichotomy ("Go-or-Grow") hypothesis, which might play a central role in the biology of these tumors.

We first propose a "Go-or-Rest" model and describe cell migration as a velocity-jump process including resting phases. We derive a continuum (macroscopic) model that provides anomalous diffusion that we analyze. In particular, we show that sub- and super-diffusion regimes can be obtained, and are governed by a parameter describing intrinsic migratory properties of cells. We demonstrate the potential of the model to reproduce in-vitro data of glioma tumor expansion when the switch to quiescence is density-regulated. We furthermore show how this density-regulation may lead to the formation of immotile aggregates in the context of the Turing instability. Finally, by including cell proliferation, we present a continuous "Go-or-Grow" model and show the influence of the density-dependent switch on the resulting traveling wave.