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Travelling Waves of a New Glioma Invasion Model

I will explore travelling waves for a new glioblastoma multiforme model in this talk. In their Nature paper [4], Osswald and collaborators recently presented a detailed study of in-vivo glioma invasion patterns in the healthy brain tissue of living mice. This paper presents evidence that specialized cancer cells build a network much like a healthy brain neuronal network, which can transmit signals such as calcium waves, forming a glioma-wide communication system. Working jointly with Thomas Hillen, Kevin Painter, and Nadia Loy, our goal is to incorporate the new network formation phenomenon into previous Glioma blastoma models. The model is based on the kinetic model framework, where we can quickly introduce new reaction dynamics for the network formation. We can arrive at a coupled reaction-diffusion equation by making some time scale arguments. From this equation, we will show the existence of Traveling waves with a minimal spreading speed. In addition, we can reduce the system to the classical Fisher-KPP, allowing us to compare the effect of the approximations on the wave speed.