

Populations with heterogeneous mobility and proliferation rate

Xinran Ruan ¹

¹ Politecnico di Torino, Italy.

The migration-proliferation dichotomy observed in the spreading of tumor cells is a result of the trade-off between cell proliferation and cell mobility. It shows that a tumor consists of cells with different mobility and proliferation rate. The more mobile cells are less proliferative and vice versa. We study the process by a novel model where both the cell mobility and proliferation rate depends on the same phenotype. The migration-proliferation dichotomy is again observed. Further, we find via simulation that, in the case where mobility is bounded, compactly supported traveling fronts emerge, while the stretching fronts may occur in the case where mobility is unbounded. Formal asymptotic analysis explaining our numerical findings of the two fronts will be presented.