
Existence of solutions for nonlinear models for tumor growth.

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Abstract

We investigate a free boundary problem modeling the growth of tumors cells. The model is given by a multi-phase flow and the tumor is described as a growing continuum Ω with boundary $\partial\Omega$ both of which evolve in time.

The model is given by a multi-phase flow model: the densities of the different cells are governed by a set of transport equations, the density of the nutrient and the density of the drug are governed by rather general diffusion equations, while the velocity of the tumor is given by Brinkman's equation. Global-in-time weak solutions are obtained using an approach based on penalization of the boundary behavior, diffusion and viscosity in the weak formulation. Both the solutions and the domain are rather general, no symmetry assumption is required and the result holds for large initial data.

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