

A diffuse interface tumour model with chemotaxis and active transport

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We consider a thermodynamically consistent diffuse interface model for tumour growth, which couples a Cahn-Hilliard system and a reaction-diffusion equation. The system of PDEs models the growth of a tumour in the presence of a nutrient and surrounded by host tissue. A new feature of the model is the inclusion of transport mechanisms such as chemotaxis and active transport through specific choices of the fluxes. We will first discuss a simplified model and derive some results regarding the well-posedness of the system. Then, we will discuss the more general model, which is a Cahn-Hilliard-Darcy system coupled to a convection-reaction-diffusion equation for the nutrient. The effects of including the transport mechanisms and fluid flow will be demonstrated with numerical computations, and if time permitting, we will discuss some recent results regarding the existence of weak solutions to the general model.