

# Non-isothermal phase-field models for tumor growth

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We present two different diffuse interface models for tumor growth. In this context, the tumor is seen as an expanding mass surrounded by healthy tissues, while the interface in between contains a mixture of both healthy and tumor cells. The evolution of the system is assumed to be governed by biological mechanisms such as proliferation of cells via nutrient consumption and apoptosis. Besides, both the models include the effects of temperature variations. From the medical point of view, it is clear that the temperature does have effects on tumor growth and that in particular hyperthermia can lead to partial or complete destruction of tumor cells.

The first model is a Cahn-Hilliard model, while the second is of Allen-Cahn type. After deriving the models following the microforces approach, we focus on proving the well-posedness and compare which regularity we are able to get for the solutions.

Part of these results have been obtained in a recent collaboration with Stefania Gatti and Alain Miranville.