

NONLINEAR DIFFUSION AND TUMOUR GROWTH

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ABSTRACT. A fundamental problem in Biology consists in understanding cell migration and the interaction with the environment. When the number of cells is large (as it is often the case in biological systems such as tumours), we can consider the evolution of their density function, which is usually described by a PDE.

Such models are useful in the description of both healthy and tumorous cells and a great number of different equations has been proposed to study such phenomena.

In mathematical terms, the choice a particular diffusion coefficient leads to different models and results, hence it would be important to construct a way to classify such equations depending on the characteristics of solutions corresponding to different nonlinearities.

Other interesting challenges arise when we consider more than just one species of cells (e.g. healthy and mutated), since this often results in a system of equations the study of which is non-trivial.

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