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A size and space structured model for tumors and immune cell interactions

In this presentation we will first introduce a mathematical model intended to describe the interactions between effector immune cells and tumors. The model is structured in size and space, and it takes into account the migration of the tumor-antigen specific CD8+ effector T-cells towards the tumor micro-environment by a chemotactic mechanism, the strength of which is driven by the development of the tumors. The model exhibits a possible control of the tumor growth by the immune response. Nevertheless, the control is not complete in the sense that the asymptotic states keep residual tumors and activated immune cells. Moreover, by using global sensitivity analysis methods, we investigate the role of the parameters of the model. The findings can be used to design optimized therapy combinations. And finally we will introduce an extended model which describes the effect of pro-tumor immune cells such as Tregs, TAN and TAM.