

# Diffusion equation model for the tumors cell density and immune response

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**Abstract:** Over the last 20 years increasingly complex mathematical models of cancerous growths have been developed, especially on solid tumors, in which growth primarily comes from cellular proliferation. Consider a procedure for cancer therapy which consists of interaction between immune response (immune cells) and tumor cells without any specific drug. The cytotoxic T lymphocyte (CTL) and tumor necrosis factor (TNF) cause of the immune response. This process is modeled as a system of tumor cell density (TCD) and tumor necrosis factor (TNF). The purpose of this paper is to establish a rigorous mathematical analysis of the model and to explore the density/concentration of tumor cell and immune response (TNF). The result suggests that although TCD capable to growth of tumor but the immune response is block to direct tumor growth. The model assumes that only two factors need be considered for such predictions: net growth rate and infiltrative ability. The model has already provided illustrations of theoretical glioblastomas, but also shows the distribution of the diffusely infiltrating cell.