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Analysis of a mathematical model of tumor lymphangiogenesis. (English) Zbl 1060.92036

Math. Models Methods Appl. Sci. 15, No. 1, 95-107 (2005).

From the paper: Tumor growth and dissemination are associated with the formation of new blood vessels, a process called angiogenesis, and new lymph vessels, a process called lymphangiogenesis. The lymphatic system provides a much more favorable environment for tumor invasion and metastasis than does the blood vasculature. Although intensive research in tumor angiogenesis has been going on for the past four decades, experimental results in lymphangiogenesis began to appear only in the last five years. A major obstacle to research in lymphangiogenesis has been the lack of specific markers that could accurately differentiate between the two systems of vasculatures. There are quite elaborate mathematical models of tumor angiogenesis.

Recently the authors developed a mathematical model of lymphangiogenesis for tumors, and obtained some numerical results. The walls of lymph vessels are made up of loosely connected endothelial cells, and, in this mathematical model, the presence of lymph vessels is equated with the presence of "high" density of endotheliall cells. The model consists of eight semilinear parabolic PDEs. The purpose of this paper is to prove that this parabolic system has a unique solution for all $t > 0$.

MSC:

92C50 Medical applications (general)
35K35 Initial-boundary value problems for higher-order parabolic equations

Cited in **40** Documents

Full Text: DOI

References:

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[3] DOI: 10.1007/s002850000037 · Zbl 0977.92013 · doi:10.1007/s002850000037

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