

JOHANNES GUTENBERG-UNIVERSITÄT MAINZ - 55099 Mainz

Einladung zum Vortrag
im Oberseminar Analysis

Modeling Liver Infections with Reaction-Diffusion Equations

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Liver infections like hepatitis B and C are worldwide spread diseases, which tend to chronify. Long-lasting inflammations often lead to deathly secondary diseases like liver cirrhosis or cancer.

The underlying mechanisms of the chronification are not fully understood and therefore mathematical models are used for finding and testing new hypothesis about the development of the disease and possible interactions between the virus and the immune system.

The reaction-diffusion system is based on a predator-prey system and describes the interaction of virus and cells of the immune system on a mesoscopic scale, where the cells of the immune system are concluded as general T cells. The model shows healing infection courses and chronification of the infection, depending on the extension of the domain and parameters like the reaction change rate and the diffusion strength.

I present a hierarchical model family with linear and nonlinear reaction-diffusion models, stationary models and space-independent models. The models of the model family are analysed by using different mathematical approaches, compare. We gain insight in the mechanisms leading to higher chronification tendency by regarding the whole model family and the different information provided by each model. The model finds application in analysing different treatments and the effects of infection and treatment on the organism.

Alle Interessierten sind herzlich eingeladen!

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FACHBEREICH 08

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