

NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING
SEMINAR

Local Immunodeficiency: Minimal Network and Stability

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Abstract: Cooperation between different kinds of viruses, or cross-immunoreactivity, has been observed in many diseases. Instead of a one-to-one relationship between viruses and their corresponding antibodies, viruses work together. In particular, some diseases display a phenomenon where certain viruses sacrifice themselves, taking all the fire from the immune system while some other viruses stay invisible to the immune system. The fact that some viruses are protected from the immune system is called local immunodeficiency. A new math model has been developed to describe such cooperation in the viral population growth using a relationship network. Numerical simulation has already produced promising results. I analyzed some simple cases theoretically to find the smallest relationship network that has a stable and robust local immunodeficiency.

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