Stochastical modeling for Viral Disease: Statistical Mechanics and Network Theory HAO ZHOU, MICHAEL DEEM, Rice University — Theoretical methods of statistical mechanics are developed and applied to study the immunological response against viral disease, such as dengue. We use this theory to show how the immune response to four different dengue serotypes may be sculpted. It is the ability of avian influenza, to change and to mix, that has given rise to the fear of a new human flu pandemic. Here we propose to utilize a scale free network based stochastic model to investigate the mitigation strategies and analyze the risk.

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