MODELLING THE INTERACTIONS BETWEEN PATHOGENS AND THE IMMUNE SYSTEM

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In this talk I will provide an overview of the work I have done over the years on population-level and within-host pathogen dynamics, as mediated by the immune system. Focusing on some specific examples, such as dengue and malaria, I will show how the techniques of equivariant bifurcation theory can provide useful insights into disease dynamics. I will also discuss modelling various aspects of immune response to viral infections, with particular emphasis on understanding the emergence of pathogen-induced autoimmunity. The talk will conclude with a brief review of our latest work on modelling within-cell replication of coronaviruses.