

Immune response and virulence evolution, Carles Barril

The evolution of viral traits is affected by different selective pressures. In order to persist, viruses have to replicate within cells, infect other host cells and be transmitted to new individuals.

Thus, viral dynamics, and hence viral evolution, can be classified depending on the level at which these events take place. In this talk we will focus on a model of lytic viruses in order to show how the competition between viral particles and the immune response affect the evolution of virulence. The model takes into account, on the one hand, the dynamics inside individual hosts and, on the other, the population of infected and susceptible hosts. This makes it possible to compare the optimal viral phenotype at the population level with the selected phenotypes at the host level. In particular, we have found that the selected strategies at both levels are similar when the immune response is fast, whereas the selected strategy at the population level changes towards lower virulent phenotypes as the immune response takes longer to appear.

Work in collaboration with I. Shingo, S. Nakaoka and O. Diekmann.