

Immune selection and evolution of multi-strain malaria quasi-species.

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Multiple forces drive evolution of parasites in host populations, and immune selection plays an important part. Malaria parasite *Plasmodium falciparum* has developed several ways to avoid host immunity. The key strategy is antigenic variation, whereby parasite would switch expressed antigens contained in its genetic repertoire, and thus prolong infection duration and successful transmission.

The talk will review some conventional concepts and models of evolution \ selection for multi-strain parasites and the role of host immunity. Then I will outline a new agent-based modeling approach to genetically-structured malaria parasite, that accounts for essential features of its in-host biology and immunology. The model will be applied to basic questions of evolutionary biology of host-parasite systems: (i) the meaning of ‘fitness’ and selection, (ii) parasite diversity and connectivity network (relationship between multiple strains), (iii) the resulting parasite population structure (distribution in host communities), (iv) the relative importance of competitions vs. cooperation.

References

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