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Immune response and within-host viral evolution: immune response can accelerate evolution

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Highlights

- A model within-host viral evolution with immune response is suggested
- The model is mechanistic and is a development of an earlier suggested model of RNA virus (HIV) evolution without immune response
- Three principal scenarios of evolution are possible for this model framework, namely (i) the development of immune resistance, (ii) evolutionary escape without the development of immune resistance, and (iii) increasing Darwinian fitness. (Please note that scenario (iii) can progress without immune response at all; evolution towards decreasing virulence of adaptation to a specific host are examples).
- Impact of immune response on viral evolution in scenario (iii) is considered. (Scenarios (i) and (ii) are left out of the scope.)
- Simulations show that immune response is able to accelerate evolution in scenario (iii)
- HIV is a case study

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