## How Modeling Viral Infections Can Save Lives

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MODELING viral infections within single hosts has provided a number of insights into the dynamics of viral infections and the effects of antiviral therapy. Here I will review work on human immunodeficiency virus (HIV) and hepatitis C virus infection (HCV). I will show how modeling of HIV combined with clinical data has identified four time scales associated with key viral processes, established the need to introduce combination antiretroviral therapy, and has helped identify bottlenecks in eradicating HIV infection. I will also review related work on HCV infection and show how modeling has allowed one to estimate the effectiveness of a new antiviral agent with a two day clinical trial as well as estimate the duration of therapy needed to cure the infection. Lastly, I will show how using multiscale models has improved our understanding of the effects of antiviral therapy and allowed us to determine the in vivo mode of action of antiviral drugs.