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A simple in-host treatment model exhibiting sustained immunity

In many epidemiological models, treatment works by lowering the reproduction number of the pathogen below a threshold. However, in these models, the pathogen reestablishes itself if the treatment is stopped. We present a simple example of a model where treatment can be stopped without reemergence of the pathogen. A situation referred to as sustained-immunity. This is possible because a stable infection-equilibrium coexists with a stable infection-free or low-infection state. Treatment, if applied for a sufficient time, can move the system into the basin of attraction for the infection-free equilibrium, and immunity is sustained after treatment is stopped. This is joint work with Norah Alshobrami and Lin Wang.