

Modeling the Within-Host Dynamics of Cholera: Bacterial-Viral-Immune Interaction

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We present a mathematical model to investigate the within-host dynamics of cholera. We formulate a system of nonlinear differential equations to describe the evolution and interplay of the pathogenic bacteria at different stages, the viruses, and the immune response inside the human body. Our analysis shows that the basic reproduction number of this model is determined collectively by the bacterial, viral, and immune reproduction numbers and that the bacterial-viral-immune interaction shapes the complex dynamics of cholera infection within a human host.

*Contributed talk