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Modeling Early Events in Hepatitis Delta Virus Infection

Delta hepatitis virus (HDV) is a dependent satellite virus of hepatitis B virus. HDV relies on surface proteins produced by HBV to create new virus particles, but also has an inhibitory effect of HBV replication and the two species compete for common resources inside the cell. Understanding this dependence and competition could provide targets for antiviral therapies to eliminate or prevent chronic HDV superinfection.

By exploring the early events in HDV replication, we explain the dynamics of viral release from newly infected hepatocytes, including a delay in the initiation of viral release and a precipitous decline in production after 12 days. We further explore the consequences of these dynamics for the establishment of chronic hepatitis delta in the cases of coinfection and superinfection.