

# Viral Kinetics of Genital Herpes

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Herpes simplex virus type 2 (HSV-2) infections are characterized by frequent reactivations, which are responsible for lesions in the genital tract and asymptomatic episodes of viral shedding. Shedding is episodic, and varies greatly within individuals over time. Dr. Joshua Schiffer, of the Vaccine and Infectious Diseases Division, and colleagues have carried out the first detailed kinetic evaluation of mucosal HSV-2 infection in the healthy host. Their study analyzed daily swabs from 531 HSV-2 seropositive patients, taken over a 30 day time period. The swabs were studied using quantitative PCR to detect HSV DNA levels.

The group found that episodes with higher viral production are more commonly associated with genital lesion formation and nonmonotonic viral decay, having multiple peaks of viral production during the episode. The viral kinetics are characterized by a rapid expansion, which tapers off and then is followed by a sharp decay. From episode peak to termination, the exponential decay rate increases dramatically. Within the first 24 hours of reactivation, the innate immune system's first response may work to limit expansion, though the decay rate after peak suggests that the acquired immune response in the periphery is already primed to quickly eliminate HSV-infected cells. Viral re-expansion may occur because the innate response does not completely clear the infection, or due to separate foci of viral replication in different micro-environments within genital skin.

The survival strategy of HSV-2 likely involves prolonged reactivation episodes to increase transmission, as virus is present for enough time to achieve transmission with relatively few coital acts. The HSV-2 virus survival strategy of frequent shedding is highly effective, as demonstrated by high worldwide seroprevalence of the virus.

[Schiffer JT, Wald A, Selke S, Corey L, Magaret A.](#) 2011. The kinetics of mucosal herpes simplex virus-2 infection in humans: evidence for rapid viral-host interactions. *The Journal of Infectious Diseases* 204:554-561.