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Early events during hepatitis B virus infections

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Abstract. Experimental studies in non-human primates inoculated with hepatitis B virus have shown that virus dose influences the kinetics of virus spread and the disease outcome. In particular, high and low doses lead to 100% liver infection, while intermediate doses lead to less than 0.1% liver infection. To determine the relationship between virus dynamics, percentage of liver infection, and immune priming we developed an in-host mathematical model that considers the effects of cellular immune responses in controlling the disease. We fitted the model to data and predicted correlations between dose size, the timing of the immune response, the potency of immune effects, and disease outcome. Such results can guide our understanding of the virus-host dynamics that control the virus or permit a transition to chronic disease.

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