

BURSTING AND BUDDING

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When are infectious virus or bacteria released from infected cells? We consider two types of mathematical model. In the first, ``budding'', infected cells are assumed to release new infectious particles at a constant rate (that is, constant probability per unit time). No description of the intracellular dynamics is needed; the mean number of new infectious particles released per infected cell is simply the rate of release multiplied by the mean lifetime of an infected cell. In the second, ``bursting'', infectious particles accumulate inside a host cell until the cell dies and the intracellular load is released at once. At the stochastic level of an individual cell, the simplest budding models have two types of event (release of an infectious particle and death of the infected cell) and the mathematics is consistent with the assumption that events are independent. In bursting, however, release of infectious particles and death of the host cell are not independent events: they occur simultaneously.