

Abstract Submitted
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Nucleation of holin domains and holes optimizes lysis timing of *E. coli* by phage λ GILLIAN RYAN, ANDREW RUTENBERG, Dalhousie University — Holin proteins regulate the precise scheduling of *Escherichia coli* lysis during infection by bacteriophage λ . Inserted into the host bacterium's inner membrane during infection, holins aggregate to form rafts and then holes within those rafts. We present a two-stage nucleation model of holin action, with the nucleation of condensed holin domains followed by the nucleation of holes within these domains. Late nucleation of holin rafts leads to a weak dependence of lysis timing on host cell size, though both nucleation events contribute equally to timing errors. Our simulations recover the accurate scheduling observed experimentally, and also suggest that phage- λ lysis of *E. coli* is optimized.

Gillian Ryan
Dalhousie University

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