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2025 SEA Faculty Meeting Abstract

Northwestern College

Orange City IA

Corresponding Faculty Member: Sara Tolsma (stolsma@nwciowa.edu)



Sara S Tolsma

Bactericidal or bacteriostatic? An experimental approach to distinguishing the two in the context of SEA-GENES cytotoxicity assays.

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Our lab has been working on a systematic genetic screen of the mycobacteriophage Island3. Island3 is a cluster I1 phage. Its genome includes 76 putative protein-coding genes. We cloned all 76 genes and assayed them for their ability to influence host cell growth (cytotoxicity) when overexpressed. Genes 35 and 36 were both scored as cytotoxic. Overexpression of Island3\_35 caused only a modest reduction in colony forming units (CFU) but each colony’s size was noticeably reduced. Overexpression of Island3\_36 led to a dramatic reduction in CFU. Based on these observations, we hypothesized that Island3\_35 is bacteriostatic and Island3\_36 is bactericidal. We designed a series of experiments to test this hypothesis. Our initial experiments appear to support our hypothesis.