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2025 SEA Symposium Abstract

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Genetic Screen to Understand Phage Gene Function

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For years, healthcare providers have raised concerns regarding the use of antibiotics to treat bacterial infections. Bacteriophages, viruses that infect bacteria, are a promising alternative to the use of antibiotics. Phages target specific bacteria and kill them. Using phages to treat bacterial infections is phage therapy. To use phages in phage therapy we need to understand phage biology fully. To advance this objective we are using a genetic screen to identify genes in phages Island3, Sbash, and EagleEye that interfere with host cell growth (cytotoxicity) and genes that protect the host from infection by another phage (defense). So far, we have cloned all 76 of Island3’s genes. Of these, 15 are toxic and 6 confer defense. We have cloned 71/89 Sbash genes of which 14 are toxic and 3 confer defense. Finally, we have cloned 51/97 EagleEye genes of which 5 are toxic and 6 confer defense.