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Brigham Young University

Provo UT

Corresponding Faculty Member: Julianne Grose (julianne\_grose@byu.edu)

Burst Size and Lifecycle Timing of Gordonia rubripertincta Bacteriophage SummitAcademy

Emilee Carr, Hunter Cobbley, Alyssa Cranston, Parker Danielson, Nathaniel Eberhard, Ben Gordon, Jonah Rallison, Lauren Wells, Sean Wolthuis, Ethan Zaugg, Julianne Grose

Gordonia rubripertincta is a gram-positive bacterium that can act as an opportunistic pathogen in individuals who have been immunocompromised. In 1988, a Gordonia rubripertincta lung infection, clinically resembling tuberculosis, was reported in a patient that showed no immunosuppression. Bacteriophages that infect Gordonia rubripertincta could aid in our understanding of the evolution of pathogenic strains as well as be useful in treatment of antibiotic resistant infections. In collaboration with a local high school, we have isolated a Gordonia rubripertincta bacteriophage and sequenced and annotated its genome. We are now interested in discovering if this bacteriophage could be used in an anti-Gordonia cocktail based on its properties of infectivity, including replication timing and burst size. A one-step infection curve allows us to know how quickly our phage infects, replicates and releases from bacteria as well as how many phages emerge from the infection of a single cell (burst size). This information on replication timing will then be used in RNAseq experiments to determine transcriptional timing of individual genes, which correlates with protein function. Burst size, on the other hand, will be useful in modeling phage therapy applications. Overall, the results of our research will help us understand the biology of the Gordonia phage SummitAcademy, which may facilitate its use as a treatment of antibiotic-resistant strains of Gordonia.