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Effect of cryogenic storage on Mycobacteria smegmatis

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It is understood that bacteriophages can infect M*ycobacterium smegmatis*, and is used for a variety of different research techniques. However, one uncontrolled variable in this research is that different cultures of host cells are used at various points in the project. Cryogenic preservation is widely used for long-term storage of bacterial cells and could overcome this limitation. However, the effect of freezing on the viability and infectability of host cells remains underexplored. The end goal is to establish a foundation of whether *M. sm*eg cells can be frozen for extended periods of time without damaging the viability and infectability of cells. This study is broken down into two main objectives; viability of cells after freezing *M. smeg* cells for 3 months and the effects freezing has on *M. smeg* cells' ability to be infected by mycobacteriophage GrecoEtereo. The results of both frozen and non-frozen cells resulted in the same number of colony-forming units. Additionally, when infected with GrecoEtereo, there was a similar number of plaque forming using produced using frozen or non-frozen cells. Our work has established that frozen cultures of cells can be used for phage hunting, which can reduce the batch-to-batch variability of freshly cultured cells.