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Presenter Information

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Comparing the Impact of Heat Activation and Ammonium Chloride on the Germination of *Bacillus anthracis* Spores

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Bacillus anthracis is a gram-positive spore-forming bacteria that is the causative agent of anthrax. Spores of many *Bacillus* species have been shown to germinate poorly unless first activated by one of a variety of treatments. Previous research conducted in *Bacillus cereus* spores has shown that the addition of ammonium chloride (NH₄Cl) can enhance germination. Because *B. anthracis* and *B. cereus* are closely related, we wondered if the same effects would be seen in *B. anthracis* spores. We conducted a series of germination assays in *B. anthracis* spores from the ΔSterne strain in the presence and absence of 40mM NH₄Cl both with and without heat activation. Spores were germinated in a reaction mixture consisting of 1mM Alanine, 1mM Inosine, and 20mM Tris-HCl pH 7.5 in the presence or absence of NH₄Cl. Initial results indicate that germination is enhanced by NH₄Cl in both heated and unheated spores. Previous reports suggest that heat activation is necessary to achieve optimal germination rates; however, our initial results indicate that NH₄Cl alone can greatly enhance germination. We are currently in the process of testing the impact of NH₄Cl on the germination rates of spores from Sterne strain. Our preliminary data suggest that robust germination efficiencies can be achieved by adding NH₄Cl to germination reactions. By eliminating the need for heat activation, the use of NH₄Cl could simplify large-scale decontamination strategies, making them safer and more cost-effective.