

## **The Effect of Caffeine on Soil Bacteria Proliferation**

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The goal of our research was to examine the effect of caffeine on bacterial growth in soil. We hypothesized that adding caffeine to a slurry of soil bacteria would cause less bacteria to grow than it would without it, due to caffeine's antibiotic effect against certain strains of bacteria. To test this, we collected four different samples of soil from around campus and made a slurry to put the soil bacteria in solution. We plated both the treated and untreated samples to compare the growth. We additionally added a lawn of *Bacillus subtilis* reporter to both plates and observed it under a blacklight to determine if any of our bacteria were causing biofilm formation in *B. subtilis*, characterized by fluorescence around a soil microbe. To confirm if this soil microbe is a biofilm inducer, we picked it and plated it on a secondary screen of *B. subtilis* lawn. Additionally, we sent our possible inducers to a sequencing facility and blasted it on a database to see which soil bacteria we picked. Finally, we sequenced our bacteria and created a phylogenetic tree to observe that all four of our strains were closely related by a common ancestor. From our experiment we do not have enough information to accept our hypothesis.