# The Influence of Sound Frequencies on Bacterial Growth: A New Perspective on a New Research Field

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Sounds influence on bacterial growth is a very new and unexplored research field. The field is still in its infancy and the question of whether sound and/or ultrasound is a growth inhibitor or stimulator on bacteria has varying answers depending on which sound frequency the bacteria is exposed to and the type of bacteria. In this project, a review of most of the current scientific literature was conducted. The previous experiments conducted were testing sporadic sound frequencies, while the experiments conducted in this project have a more systematical approach. 45 in vitro experiments with the bacterium E. Coli K-12 were conducted to measure the influence of sound on E. Coli. A petri-dish with E. Coli was exposed to single sound waves between 17,400 Hz and 18,400 Hz with discrete intervals of 100 Hz, while a control dish with E. Coli in another room was not exposed to sound. After 48 hours of exposure, the colonies were counted in both petri-dishes and the percental difference was calculated. Five frequencies (17,600 Hz, 17,800 Hz, 18,000 Hz, 18,100 Hz and 18,200 Hz) were found to have a growth impact on E. Coli. Four sound frequencies had an inhibiting effect on the growth of E. Coli (from 54-82% reduction), whilst one (18,200 Hz) had a stimulating effect on the growth of E. Coli. Possible reasons for the inhibiting/stimulating effect could be acoustic cavitation, intake of calcium-ions, hitting the resonant frequency of the bacterium and affecting the bacteria’s flagella.

**Awards Won:**
Second Award of $2,000