

Mediating the Degradation of Nitrobenzene Into Nematicidal Chemicals Using *Streptomyces antibioticus*

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Nitrobenzene is a potential carcinogen, highly flammable, and toxic environmental pollutant in air, water, and soil that is commonly synthesized in pesticide, dye, and explosives manufacturing. Bacterial agents of the *Streptomyces* genus, particularly *Streptomyces antibioticus*, have been known to degrade nitrobenzene and subsist on it as a source of nutrients. *S. antibioticus* is also a producer of actinomycin D-- a chemical commonly used as an antibiotic, which has nematicidal properties. This study focuses on the use of *S. antibioticus* as a mediator in the degradation of nitrobenzene into a pesticide, which was analyzed through the mortality rate of *Caenorhabditis elegans*. According to the hypothesis, the mortality rate of *C. elegans* individuals treated with the degraded nitrobenzene solution was predicted to be higher than *C. elegans* not treated with degraded nitrobenzene. In order to determine the possibility of pesticide synthesis using *S. antibioticus*, bacterial cultures were established, nitrobenzene was added in quantities of either 17 or 34 ppb, and allowed to rest for 72 hours. Then, this was applied to *C. elegans* nematodes and compared to the controls (*S. antibioticus* bacteria and GYM broth). Data for this experiment had positive results and were statistically significant ($p < 0.001$), considering the low-probability mortality rates seen in experimental trials.

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