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Intellectual Property

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Biomaterials and Methods for Managing Pollution with Phenyl Urea Compounds

AzTE Case # M11-076

Invention Description

Phenylurea compounds are mass-produced, toxic compounds that find use as pesticides and include triclocarban, an antimicrobial used in disinfectants, soaps and other household products. These compounds persist during normal wastewater treatment schemes and largely become sequestered in sewage sludge. From both wastewater and sludge reclamation, they are released back into the environment where they are known to cause widespread contamination in aqueous and terrestrial environments.

Researchers at the Biodesign Institute of Arizona State University and Johns Hopkins University have discovered a new group of microorganisms capable of removing phenylurea compounds (including pesticides and triclocarban) from industrial waste streams and from contaminated natural environments. The gene sequences for these bacteria have also been determined.

These bacteria are promising agents for degrading phenylurea compounds in waste streams and in contaminated environments targeted for bioremediation.

Potential Applications

- degrading phenylurea compounds including chlorinated and non-chlorinated carbanilides in waste streams and in contaminated natural environments

Benefits and Advantages

- able to degrade a class of persistent terrestrial and aquatic pollutants
 - first bacteria shown to be able to use triclocarban as the sole carbon source
 - bacteria also are able to use non-chlorinated carbanilide as sole carbon source
 - biodegradation of phenyl urea compounds at ambient temperature and pressure represents a cost-effective means of waste treatment when compared to more energy intensive physical and chemical methods