BioDissolve: The Natural Breakdown of Polystyrene Waste through the Application of Pseudomonas putida to Produce Usable Byproducts

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Polystyrene was first commercially used in 1938 and is better known by the trademarked name ‘Styrofoam.’ Polystyrene is used in a wide range of products ranging from food beverage containers to packaging and insulation. Every year 1,885,200,000 lbs of polystyrene waste is produced per year. At present, it is not biodegradable and is estimated to last over 500 years in a landfill. It also cannot cost effectively or environmentally safely be compacted or crushed. As a result, polystyrene is choking our landfills -- accounting for over 25% of landfill use. Polystyrene is also the fifth largest creator of hazardous waste. Moreover, it mars beaches, forests, and has poisoned sea life destroying multiple ecosystems. Polystyrene has been especially harmful to poorer countries, which use polystyrene disproportionately and have limited landfill capacity. For example, Haiti is currently overrun by improperly disposed polystyrene. Nevertheless, polystyrene is useful, and in many cases unavoidably necessary, for business purposes. Therefore, a realistic solution must be devised that addresses the current stockpile while also creating an environmentally and economically sound recycling program. This would continue until polystyrene’s use is ‘phased out’ from all but the most critical commercial uses. Moreover, any method of degrading polystyrene must yield products that are less harmful to the environment than polystyrene -- usable and ideally saleable by-products. BioDissolve identifies an end-to-end solution to the polystyrene crisis by degrading polystyrene with bacteria to dissolve the polystyrene while simultaneously yielding usable byproducts, some of which can be used to improve fuel octane levels and fertilizer.

Awards Won:

First Award of $5,000

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