

NON -TECHNICAL ABSTRACT: *(State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)*

Bioplastics are defined as a form of plastic made from renewable resources such as plant starch and microbial species. Bioplastics are made from a compound called polyhydroxyalkanoate, PHA, which is fully degradable in landfills, composting sites as well as in oceans without having any side effects on the marine life. From a biotechnological point of view, the ability of the bioplastics to be biodegradable makes them a desirable substitute for petrochemical-based plastic, an environmental pollutant. Although a number of bacterial species have been identified which produce plastic, the potential to discover and identify novel species with vastly superior production capacity remains untapped. By increasing the production of bioplastics, we can reduce carbon dioxide emission, decrease plastic waste, and lessen the consumption of fossil fuels. Presently in California, there are two companies- Micromidas and Cereplast - which are actively focusing on the production of biodegradable plastics. While Micromidas utilizes naturally occurring microbial species to convert wastewater into bioplastics, Cereplast focuses on the production of sustainable and environmentally friendly bioplastics using starch derived from corn, wheat and tapioca as well as soy proteins. It is estimated that bioplastics will capture 30% of the total plastics market within the next decade. The proposed project will directly align with the new 'green' initiatives undertaken by the Obama administration and will focus on enhancing bioplastic production using a variety of molecular tools which will eventually address increasing consumer demand for compostable and renewable plastics.