



## Where I work Jesús E. Rodríguez

**M**y team and I make bioplastics from simple renewable ingredients: saltwater microbes, seaweed and seawater. The seaweed provides a carbon source for fermentation, similar to how beer is made by fermenting hops. The saltwater microbes naturally produce polymers called polyhydroxyalkanoates (PHAs) that could replace many, maybe even all, synthetic plastics. And these PHAs are biodegradable, even in cold, dark conditions such as the deep ocean. Unlike other bioplastics, this material will also compost on its own in household waste.

In this photo, from May 2023 in my laboratory at ULUU, a biotechnology company in Watermans Bay, Australia, I am adding a seawater solution to a colony of bacteria. The salt water causes the cells to explode, releasing PHAs into the solution. ULUU aims to replace all synthetic plastics with biopolymers.

I took a winding path to get here. I studied agro-industrial engineering at the Lisandro Alvarado Central Western University in

Barquisimeto, Venezuela, my home country. In my last semester, which I did at the University of Padua, Italy, I used fermentation to produce bioethanol, a renewable-energy source. I did my PhD there, then postdoctoral research at the University of Verona, Italy, focusing on microbial production of PHAs. I joined ULUU last August.

Most PHA producers use glucose from maize corn or sugar cane. Seaweed is advantageous because it grows quickly and cheaply, and we don't have to remove it from the global food supply.

Our bioplastics are being tested for use in buttons and containers. We want to offer alternatives for any industry that uses plastic, from packaging to stationery. Our latest creation is a fibre for textiles.

ULUU is a multicultural team of 16 people from around the world. We share a common vision: a world where plastics come from bacteria, not chemical factories.

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by Giacomo d'Orlando.