

Making biodegradable plastic with bacteria

In a park or along a beach, you've almost certainly seen plastic trash. Despite being exposed to the weather, plastic lingers in the environment. One solution is to infuse it with plastic-eating bacteria. But a big problem is that heat and other conditions of the manufacturing process are often inhospitable for living organisms. Researchers from BASF Corp, the University of Georgia, and the University of California, San Diego, solved that issue by evolving successive populations of the safe soil bacteria *Bacillus subtilis* in the lab to endure conditions of up to 135 °C—the temperature at which many plastics are made. During manufacturing, the bacteria survive in metabolically dormant spores—natural defense structures that are reactivated by nutrients in the soil.

The bacteria-incorporated plastic, which the researchers made through standard industrial processes, degrades faster than typical plastic. In the left column are 48-mm-long strips of thermoplastic polyurethane, an elastic and durable plastic that's commonly used in medical devices, footwear, and other applications. The strips are increasingly degraded depending on how long they were buried in compost. The bottom sample had no exposure to compost, and the top one was buried for five months. The right column shows strips of bacteria-incorporated plastic with the same relative exposure, and about 90% of it degraded within five months, even in conditions without additional bacteria populations. (H. S. Kim et al., *Nat. Commun.* **15**, 3338, 2024; photos courtesy of David Baillot, UC San Diego Jacobs School of Engineering.) —AL

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