New study could revolutionize the way we recycle

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Researchers from the University of Surrey together with colleagues from Germany, Spain and France are set to start work on a novel technique to tackle plastic waste, potentially revolutionizing the way we recycle. Engineered microbial communities will be created by the team to digest two types of plastic polymers, polyethylene terephalate (PET) and polyurethane (PU), and transform them into molecules that can be used

to develop a more environmentally friendly material, Bio-PU, which is used as a construction and insulation material.

PET is one of the main polymers for single-use plastics such as water bottles and food trays. Current physical or chemical methods to degrade PET are inefficient due to the presence of impurities and are expensive due to energy costs associated with the high temperatures required to break down the material. Research into degradation of PU is limited due to the difficulty in breaking down urethane bonds in the material.

Plastics have become an essential part of our everyday lives thanks to their versatility. However, because of their properties they are also difficult to degrade. It is estimated that 8.3 billion metric tons of plastics have been produced, out of which 6.3 billion tons ended up as waste. Only 9 percent of this plastic waste has been recycled while 12 percent was incinerated. The remaining 79 percent of plastic waste is stored in landfills or has been released directly into the environment. This new technique could generate an unconventional way to recycle that could increase recycling rates.

Dr. Jose Jimenez, Senior Lecturer in Synthetic Biology at the University of Surrey, said: "Moving away from the reliance on single use plastics is a positive step; however, the problem of how we deal with current plastic waste still needs to be addressed. Our project will investigate the ability of micro-organisms to digest plastic waste, turning it into a more environmentally friendly material that can be recycled."

Provided by University of Surrey