

- grey biotechnology-

Microbial degradation of plastic

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PLASTIC WASTE ISSUE

Plastic is used for almost every product or aim. Durability, which is its best quality, is also its main flaw: plastic takes many centuries to degrade into the environment. Therefore, plastic waste disposal is a big issue nowadays.



Free picture at <https://commons.wikimedia.org/wiki/File:YoffGarbage.jpg>

Traditional methods of plastic disposal

Plastic usually gets landfilled, recycled or burned.

Landfilling is the least convenient method since the substances that compose plastic are not recovered.



Free picture at <http://www.wikiwand.com/en/Landfill>

Burning plastic makes it possible to use energy that comes from the heat, but releases toxic gases into the atmosphere.

Recycling seems to be the best method, given that plastic can be made from plastic and not from oil.



Free picture at https://commons.wikimedia.org/wiki/File:Facility_for_collecting_and_recycling_plastic_containers.JPG

Bioremediation

This is a process through which polluted environments can be cleared. Microorganisms are used to transform harming substances into non toxic ones. This is a method that could be useful for ecosystems that have already been damaged.

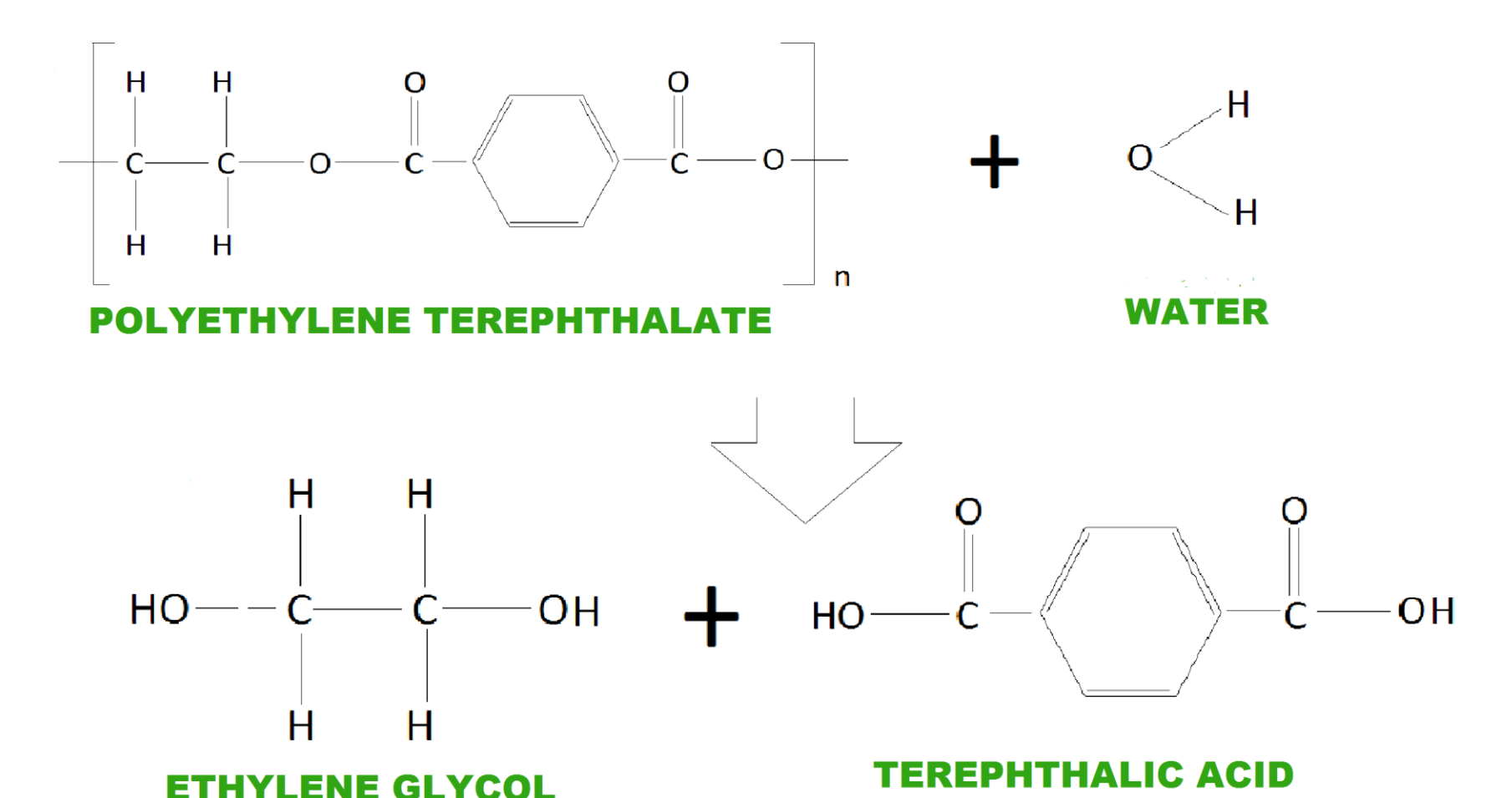
Bioremediation: PUR and fungi

In 2008 a group of researchers from Yale University examined various species of endophytic fungi. They discovered that *Pestalotiopsis Microspora* can grow on and degrade Polyurethane as a sole carbon source, both in aerobic and anaerobic conditions, through an enzyme which is similar to a serine hydrolase.

Therefore, this microorganism might be used for the clearing of environments contaminated with polyurethane.

Bioremediation: PET and bacteria

Ideonella Sakaiensis is a bacterium that has been discovered in 2016 to degrade PET. It utilizes two enzymes, ISF6_4831 and ISF6_0224, and water to produce terephthalic acid and ethylene glycol from PET. These substances are no threat to the environment.



Picture from Annalaura Coltro