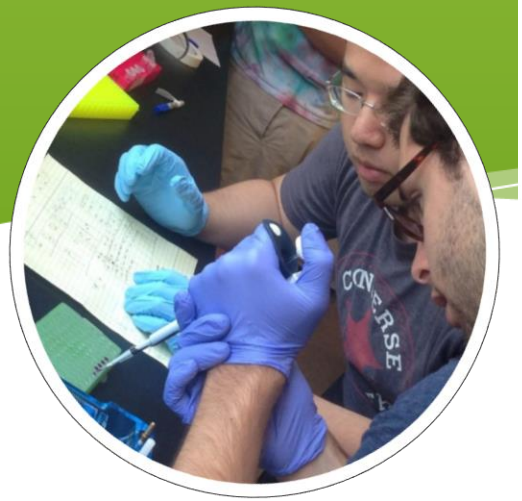
Virginia iGEM Project

To degrade nylon microplastics, we are placing a gene found in the fungus *Phanerochaete chrysosporium* into bacteria. This gene is responsible for the production of a molecule that can break down nylon. When placed in the bacteria, the bacteria will be able to break down nylon. These bacteria will be further modified to produce a bacterial film, which will allow the bacteria to be incorporated into a filter that can be used by water treatment plants. From there, the bacteria can start degrading microplastics!



About Us

The Virginia iGEM team consists of a group of multidisciplinary undergraduate students at the University of Virginia who compete against 245 other schools in an annual international synthetic biology competition: iGEM.

For more information about synthetic biology, iGEM, or on how to get involved at your high school or college, go to www.igem.org.

If you have any comments or concerns regarding NyGone, please let us know at: http://goo.gl/pKEdbB

If you'd like to donate, any amount helps! Please do so at: http://tinyurl.com/UVAiGEM2014

NyGone

A Solution to Microplastics
Virginia iGEM 2014

Microplastics: A Bigger Problem Than You Think

Microplastics are everywhere: they are in your face wash and your hand soap; you make them doing laundry. According to the North Sea Foundation, three out of four facial scrubs and peelings contain microplastics. The name describes them perfectly: small pieces of plastic up to 5 millimeters in width. Though they may seem harmless due to their small size, they are a growing problem in our waters. They accumulate toxins such as pollutants and heavy metals, and then are eaten by zooplankton and become part of the food chain, leaking toxins as they pass from organism to organism. In the picture below, a type of zooplankton called a copepod has ingested fluorescently tagged microplastics that glow green.

What Can We Do?

Unfortunately, there are no current methods to effectively remove microplastics from water. However, a solution is in the works!

A solution to this problem lies in the field of synthetic biology. Synthetic biology utilizes something that's found in all organisms: genes. Genes determine how organisms look, what they do, and how they function. In synthetic biology, genes can be taken from one type of organism and put into another. This allows the modified organism to exhibit traits that it would not exhibit in nature. For instance, by putting a specific gene from a firefly into a bacterium, you can make the bacterium glow. Using synthetic biology, we can construct a bacterium to break down these microplastics into small, harmless, molecules, thus removing them from the water supply. These bacteria can be deployed in wastewater treatment plants like the one pictured on the bottom left. Many of these plants already use bacteria to remove organic materials, and have precautions against the bacteria being released into the environment.

Currently, the 2014 Virginia iGEM, or international genetically engineered machine, team is working on creating bacteria that can degrade nylon microplastics. For more information on their project, you can check out their webpage: 2014.igem.org/Team:Virginia