

# Inspired by Slime



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Could the next great invention start with slime?

## Medical Mucus

When doctors need to close up a deep cut, they often sew it up with thread or use metal staples. Ow! Is there a better way to help wounds heal? One group of inventors may have found one—in a slug.

Snails and slugs use slippery slime to crawl around. But the dusky arion slug has a second kind of slime that it uses to

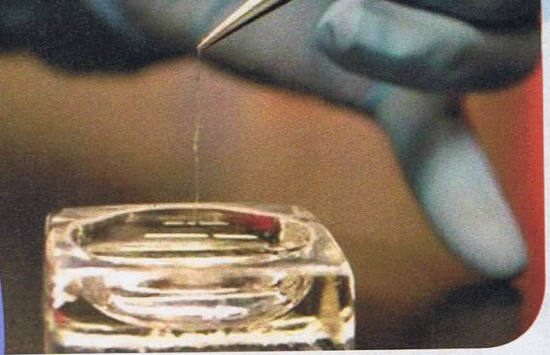
protect itself. When threatened, the orange-brown slug oozes a watery mucus from its back. Within seconds, it sets into a sticky, stretchy gel.

The result is a mouthful of syrupy goop for any animal that tries to eat the slug. Now doctors have copied the goop's formula to make an ultra-strong medical glue. Unlike other kinds of glue, the slug glue can stick to wet places. It can also stretch as the body moves. In tests, the slug-inspired glue stuck to skin, cartilage, and organs. It even fixed a hole in a pig heart, staying stuck on through thousands of heartbeats.

Andrew Smith, who studies stickiness at Ithaca College, says the new glue is stickier than super glue and stretchier than a rubber band. "Stitches are a crude way to put someone back together," he says. "I think in the future, glues like this will replace stitches."

Is this slug your doctor's new best friend?





This thin thread holds water to make the strong slime of a hagfish.

is seawater, held in place by tiny, strong threads.

Those threads really interest Douglas Fudge, who studies hagfish at Chapman University. Although each string is much thinner than a human hair, they are incredibly strong and stretchy. Fudge hopes to discover how to make these threads without having to scare hagfish. If we can figure out the hagfish's slime recipe, scientists can make more in factories.

The goal is to use the threads to make super-strong, stretchy fabrics. They might even come up with something better than the original. "These threads might one day be an earth-friendly replacement for oil-based fabrics like nylon or Kevlar in safety helmets and bulletproof vests," says Fudge.

## Fibers of the Future

Hagfish are eel-like creatures known for releasing huge amounts of slippery slime. A single hagfish can produce an entire bucket of slime in minutes.

To make all that slime, the hagfish have a secret trick. They release little packets of concentrated slime net into the water.

This expands and soaks up water to make the slime. Most of the slime



Tiny threads make hagfish slime stretchy and strong. Could they someday make super fabric?

Hagfish slime cloth! It's the latest fashion!

Maybe for a squid!



Say BOO!

Is that bucket big enough?





Sunscreen is good for protecting skin from the burning rays of the sun.

U.S. Navy researchers recently announced that they will test out materials inspired by hagfish slime to protect divers, make body armor, and even repel sharks.

### Ocean-Friendly Sunscreen

Sunscreen is useful at the beach. A thin coating of oil, chemicals, and tiny particles can block harmful rays from the sun and prevent sunburn. But when the chemicals in sunscreen wash off in the water, they can make fish and corals sick.

Vincent Bulone is a researcher in Australia who works on technology inspired by nature. He has found that some ocean algae make natural sun-blocking chemicals. When fish eat the algae, the sun-blockers also show up in their slime.

Bulone and his team mixed the algae sun-blockers with sticky stuff from the shells of shrimp and crabs. The mixture blocks the sun's rays and stays on skin. It could be added to lotion to make sunscreen.

Because it comes from ingredients naturally found in the ocean, it won't hurt fish or poison coral reefs like other sunscreens. Now Bulone's team is trying to copy the formula in a lab, so they can make a lot more of it.

All over the world, inventors are finding surprising new uses for slime. What slippery solution will they think of next? 🐙

But corals and fish don't like to sip sunscreen.

Well, you never see a sunburned fish, right?

