

# Hagfish slime found to be much more effective at blocking pores than thickening agents

March 30 2023, by Bob Yirka

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<https://picryl.com/search?q=%23elasticity>

Dr. Ryan Kincer demonstrates the elasticity of the authentic Pacific hagfish slime at Naval Surface Warfare Center Panama City Division. (U.S. Navy photo by Ron Newsome) File# 161129-N-PB086-019. Credit: U.S. NAVY/ Public Domain

A team of biologists and engineers at Chapman University, working with colleagues from the University of Illinois Urbana-Champaign and the University of Guelph, has found that slime produced by hagfish has far more clogging power than other types of thickening agents. The work is published in the *Journal of The Royal Society Interface*.

Hagfish are a type of marine fish that are eel-shaped and are famous for producing slime as a [defense mechanism](#). Hagfish emit large amounts of a milky, fibrous slime or mucus from about 100 glands running along their sides. When provoked or attacked they give off huge amounts of the slime, which thickens the water around them and wards off predators by clogging their gills. In this new effort, the researchers wondered how effective the slime produced by the fish is compared to other thickening agents.

To test the slime, which also has silk-like fibers mixed into it, the researchers applied samples to a sieve in their lab, dumped water over it, then timed it to see how long it would take for the water to pass through. They also tried dissolving slime samples in water before applying it to their sieve. Next, they did the same with three common thickening agents: polyethylene oxide, psyllium husk and xanthan gum.

In looking at the numbers, the research team found that the [hagfish](#) slime was much better at clogging the pores of the sieve than any of the thickening agents. More specifically, they found that it was two to three

orders of magnitude better. They found also that they could get the same degree of pore clogging as the thickeners by applying up to 1,000 times less of the hagfish slime.

The team then turned their attention to the threads in the slime—when they removed them from a sample, they saw no difference in clogging ability, but found that the fibers enhanced the endurance of the slime, keeping the [slime](#) from washing away over repeated tests.

**More information:** Luke Taylor et al, Mechanisms of gill-clogging by hagfish slime, *Journal of The Royal Society Interface* (2023). [DOI: 10.1098/rsif.2022.0774](#)

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