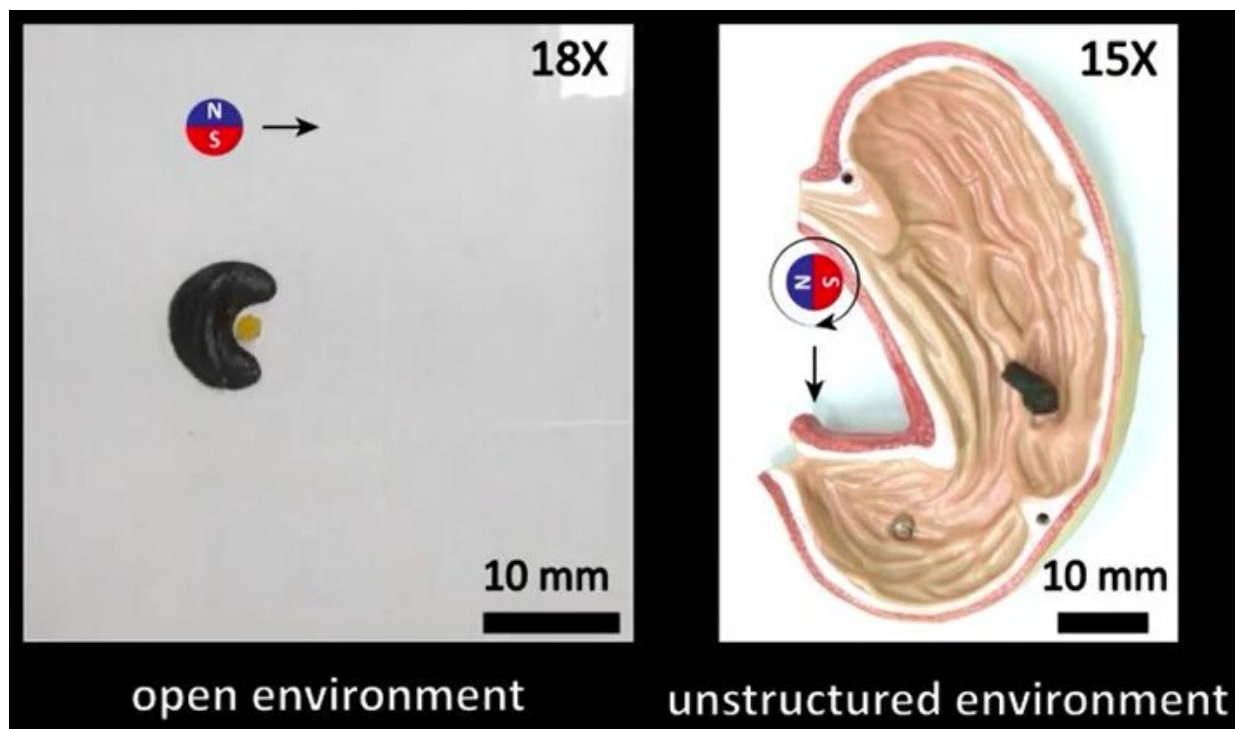


# On-the-fly reconfigurable magnetic slime used as a robot

April 6 2022, by Bob Yirka



Credit: *Advanced Functional Materials* (2022). DOI: 10.1002/adfm.202112508

A team of researchers affiliated with a host of entities in China has created a type of magnetic slime that can be configured on the fly to perform a variety of robotic tasks. In their paper published in the journal *Advanced Functional Materials*, the group describes their slime, possible uses for it and the actions they have taken to make it less toxic.

Over the past several years, scientists have developed a variety of soft robots meant for possible use in the [human body](#) as therapeutic devices. In this new effort, the researchers have added to that list a type of slime that might one day be used to retrieve material swallowed accidentally or to repair internal injuries.

Most soft robots meant for use in the body are extremely small, allowing them to move within arteries or veins and into organs. The [soft robot](#) developed in China is much larger, on the order of a ping pong ball. As with other soft robots, applying a magnetic field activates movement. Unlike most other soft robots, however, the same magnetic field can also be used to change the shape of the robot on the fly.

The slime is a mixture of neodymium magnet particles, borax and polyvinyl alcohol. The result is a dark brown blob that responds well to a [magnetic field](#). Using that field, engineers were able to configure the robot into a torus, a half-torus, a pancake, a sphere and a straight line. They demonstrated in a YouTube video configurations that could be used to manipulate objects. The half-torus, for example, could be used to corral one or more objects and push them in a desired direction. And they cleverly used the pancake shape to bind two pieces of wire together by rolling them into the [robot](#) body. They note that a similar technique could be used to envelop an object to be moved to a desired location.

The researchers also note that the [slime](#) is toxic and thus not suitable for use in the body. To overcome that limitation, they applied a silica coating, which, they noted, would last only a short time.

**More information:** Mengmeng Sun et al, Reconfigurable Magnetic Slime Robot: Deformation, Adaptability, and Multifunction, *Advanced Functional Materials* (2022). [DOI: 10.1002/adfm.202112508](https://doi.org/10.1002/adfm.202112508)

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