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'Magnetic turd': scientists invent moving slime that could be used in human digestive systems

Donna Lu

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Scientists have created a moving magnetic slime capable of encircling smaller objects, self-healing and “very large deformation” to squeeze and travel through narrow spaces.

The slime, which is controlled by magnets, is also a good electrical conductor and can be used to interconnect electrodes, its creators say.

The dark-coloured magnetic blob has been compared on social media to Flubber, the eponymous substance in the 1997 sci-fi film, and described as a “magnetic turd” and “amazing and a tiny bit terrifying”.

Prof Li Zhang, of the Chinese University of Hong Kong, who co-created the slime, emphasised that the substance was real scientific research and not an April fool’s joke, despite the timing of its release.

The slime contains magnetic particles so that it can be manipulated to travel, rotate, or form O and C shapes when external magnets are applied to it.

The blob was described in a study published in the peer-reviewed journal [Advanced Functional Materials](#) as a “magnetic slime robot”.

“The ultimate goal is to deploy it like a robot,” Zhang said, adding that for the time being the slime lacked autonomy. “We still consider it as fundamental research – trying to understand its material properties.”

The slime has “visco-elastic properties”, Zhang said, meaning that “sometimes it behaves like a solid, sometimes it behaves like a liquid”.

It is made of a mixture of a polymer called polyvinyl alcohol, borax – which is widely used in cleaning products – and particles of neodymium magnet.

“It’s very much like mixing water with [corn] starch at home,” Zhang said. Mixing the two produces oobleck, a non-Newtonian fluid whose viscosity changes under force. “When you touch it very quickly it behaves like a solid. When you touch it gently and slowly it behaves like a liquid,” Zhang said.

While the team have no immediate plans to test it in a medical setting, the scientists envisage the slime could be useful in the digestive system, for example in reducing the harm from a small swallowed battery.

“To avoid toxic electrolytes leak[ing] out, we can maybe use this kind of slime robot to do an encapsulation, to form some kind of inert coating,” he said.

The magnetic particles in the slime, however, are toxic themselves. The researchers coated the slime in a layer of silica – the main component in sand – to form a hypothetically protective layer.

“The safety [would] also strongly depend on how long you would keep them inside of your body,” Zhang said.

Zhang added that pigments or dye could be used to make the slime – which is currently an opaque brown-black hue – more colourful.

