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US researchers design 3D printed indigestible pill

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3D printed pill samples gut microbiome to aid diagnosis and treatment

A research team led by Tufts University engineers in the US has developed a 3D printed ingestible pill that samples bacteria found in the gut, known as the microbiome, as it passes through the gastrointestinal tract (GI).

The ability to profile bacterial species inhabiting the gut could have important implications for the understanding of conditions that affect and are affected by the intestinal microbiome, according to the researchers.

The 3D printed pill described in the journal Advanced Intelligent Systems represents the first non-invasive diagnostic tool capable of providing a profile of microbiome populations throughout the entire GI tract, according to the researchers.

The pill is more sophisticated than just a sponge. It is manufactured in a 3D printer with microfluidic channels that can sample different stages of the GI tract. The surface of the pill is covered with a pH sensitive coating, so that it does not absorb any samples until it enters the small intestine (bypassing the stomach) where the coating dissolves.

The pill has been studied extensively in vitro and in vivo and found to provide accurate identification of bacterial populations and their relative abundance. It has been tested in pigs and primates, yet clinical trials will be needed to determine if the pill can be used routinely in humans for clinical care.