



Living tattoos

Innovation > Work & Lifestyle > New 3D printing technique uses genetically programmed living cells

NEW 3D PRINTING TECHNIQUE USES GENETICALLY PROGRAMMED LIVING CELLS

 WORK & LIFESTYLE

Engineered bacteria can be printed into 'living tattoos' opening new opportunities for personalized medical treatments.

Personalization has been tackled by many industries including healthcare with solutions such as [bespoke administration of medicine doses](#). Research in the area of cellular engineering has also intensified in an attempt to produce compounds that could offer more targeted therapeutic solutions to patients in need. Now, researchers at [MIT](#) (the Massachusetts Institute of Technology) have invented a way to 3D print a patch of bacteria cells to create a 'living tattoo' which could be used for medical purpose or to fabricate flexible sensors capable of detecting a variety of chemical and molecular compounds.

Traditionally, 3D printing uses plastics or nylon to create its structures, but the researchers were able to use the bacteria, which was modified to enable it to withstand the process of being squeezed out of a nozzle. The cells are then printed layer by layer to create a 3D interactive structure – in this case, a tattoo. The bacteria is engineered to respond to a variety of stimuli when mixed with hydrogel and nutrients. In the test, the cells formed the shape of a tree. Each branch of the tree is lined with cells that are sensitive to a different chemical or molecular compound, so that the entire design can respond as a whole when it comes into contact with certain chemicals, and different sections can light up. As this is just an example of the technology's functionality, hopes are high that the theory behind it will have a wide range of implications. "We can use bacterial cells like

workers in a 3D factory,” says researcher Xinyue Liu. “They can be engineered to produce drugs within a 3D scaffold, and applications should not be confined to epidermal devices. As long as the fabrication method and approach are viable, applications such as implants and ingestibles should be possible.”

Other innovative ways that 3D technology is being used include a Californian company that prints and delivers [popsicles](#) in any shape you can imagine, and ‘[liquid glass](#)’, a unique material that allows the user to create anything in glass in room temperature. Clearly we’ve only just scratched the surface with 3D printing’s capabilities. What other applications could there be for this technology?

12th January 2018

Website: web.mit.edu

Contact: twitter.com/mit

[Download PDF](#)