

# Life, but not as we know it?

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Researchers at The University of Nottingham have taken some important first steps to creating a synthetic copycat of a living cell, a leading science journal reports.

Dr Cameron Alexander and PhD student George Pasparakis in the University's School of Pharmacy have used polymers — long-chain molecules — to construct capsule-like structures that have properties mimicking the surfaces of a real cell.

In work published as a 'VIP paper' in the journal *Angewandte Chemie International Edition*, they show how in the laboratory they have been able to encourage the capsules to 'talk' to natural bacteria cells and transfer molecular information.

The breakthrough could have a number of potential medical uses. Among them could be the development of new targeted drug delivery systems, where the capsules would be used to carry drug molecules to attack specific diseased cells in the body, while leaving healthy cells intact, thereby reducing the number of side affects that can be associated with treatments for life-threatening illnesses such as cancer.

The technology could also be used as an anti-microbial agent, allowing doctors to destroy harmful bacteria, without attacking other health-promoting bacteria in the body, which could offer a new weapon in the fight against superbugs.

Dr Cameron Alexander said: “These are very primitive steps in the lab,

and still a long way from a true synthetic counterpart to a biological cell, but we have demonstrated that we can transfer certain molecules from inside the synthetic capsule to the bacteria when they are in physical contact, which is an exciting development.

“It's extremely early stages, but it's a move closer to the big experiment when we can one day ask whether a natural cell can think a synthetic cell is one of its own.”

The work has been funded through the IDEAS Factory programme run by the Engineering and Physical Sciences Research Council (EPSRC), which aims to promote blue sky, curiosity-led research. It comes ahead of the launch of one of the UK's first research networks into synthetic biology, which is led by Nottingham computer scientists and pharmacists with chemists at Oxford and Glasgow universities. The network, funded by the Biotechnology and Biological Sciences Research Council (BBSRC) and the EPSRC Life Sciences Interface Programme, involves collaboration across six centres and includes scientific and ethics experts in the emerging field of synthetic biology.

The paper, entitled Sweet-talking Double Hydrophilic Block Copolymer Vesicles, can be accessed online at [dx.doi.org/10.1002/anie.200801098](https://doi.org/10.1002/anie.200801098)

Source: University of Nottingham

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