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# Singapore develops versatile drug delivery system inspired by self-assembling proteins from caterpillars

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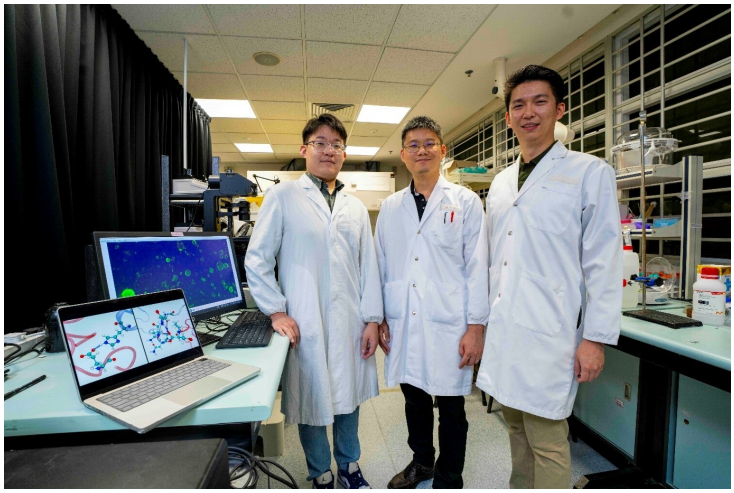
**Compared to conventional drug delivery methods, the nanocapsules are not toxic and can efficiently deliver various drugs with different properties**



Harnessing the self-assembling abilities of proteins from the cuticles of Asian corn borer moth caterpillars (*Ostrinia furnacalis*), Nanyang Technological University (NTU), Singapore scientists have created nanosized capsules that could be used to deliver drugs and messenger RNA (mRNA).

The researchers analysed the proteins in the cuticle from the heads of Asian corn borer caterpillars to identify chains of amino acids, known as peptides, that could assemble into ordered structures independently. They screened the proteins for peptides that contained the same sequence of amino acids repeating three or more times, with each sequence consisting of at least five amino acids. Due to the interactions between the repeating amino acids, peptides with this property will likely undergo self-assembly.

The scientists identified three peptides that could self-assemble to form hollow nanocapsules from their analysis. The research was led by Assoc Prof Yu Jing of NTU's School of Materials Science and Engineering, former NTU Distinguished University Professor Gao Huajian (now a Xinghua University Professor at Tsinghua University), Prof Liu Tian of Dalian University of Technology and Prof Yang Qing of the Chinese Academy of Agricultural Sciences.

The researchers are applying for a patent for their innovation, based on their study findings that were reported in *Nature Nanotechnology* in April 2024.

In the next step, the researchers will explore using artificial intelligence technologies such as machine learning to identify other natural self-assembling peptides automatically.

Image caption- *From left: Dr Li Haopeng, research fellow from NTU's School of Materials Science and Engineering; Assoc Prof Yu Jing of NTU's School of Materials Science and Engineering and Dr Qian Xuliang, research fellow from NTU's School of Mechanical and Aerospace Engineering*