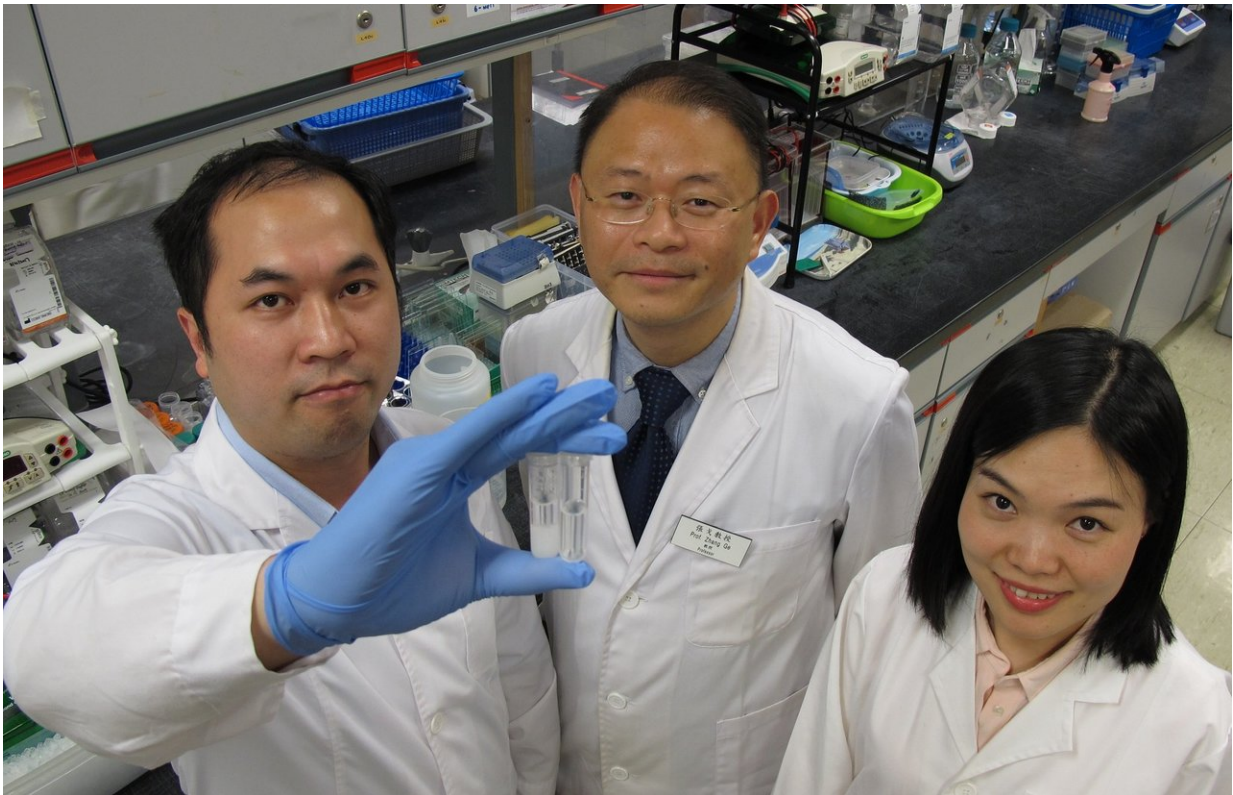


# Researchers develop a new generation of tumor-specific aptamer-drug conjugate

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Professor Zhang Ge (centre), Dr. Li Fangfei (right) and Dr. Lu Jun share the significant research findings. Credit: HKBU

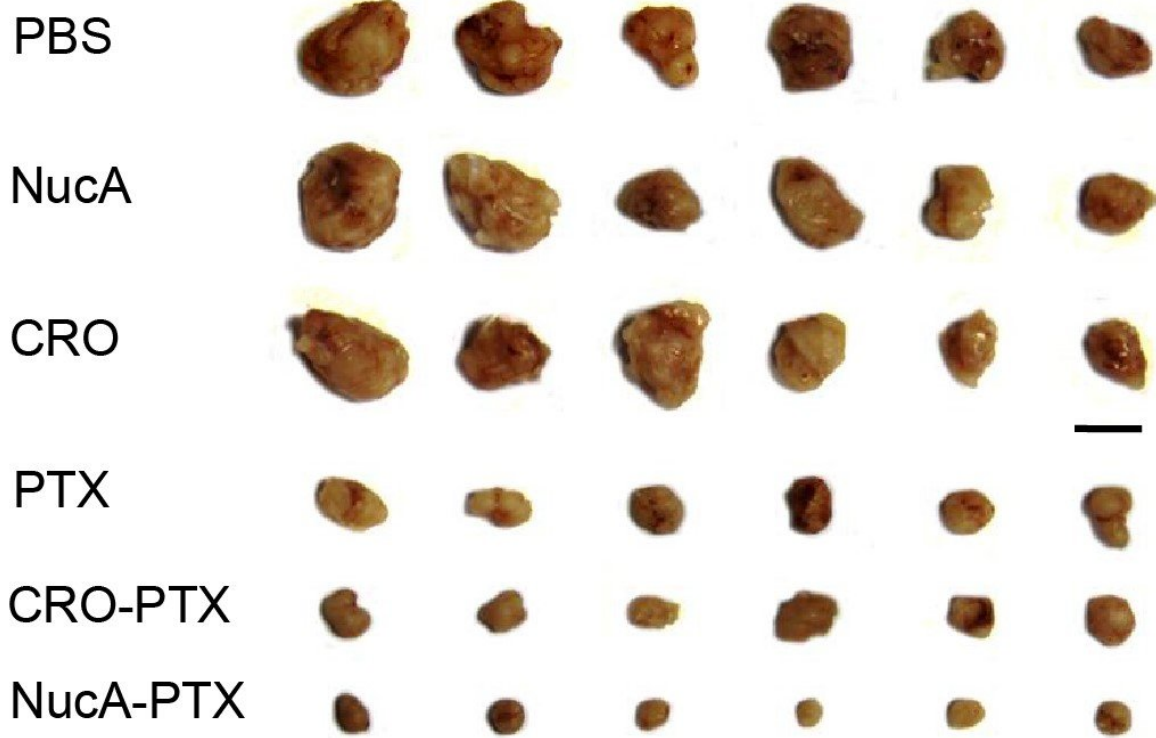
The toxic nature of chemotherapy poses a great challenge to clinical treatment of cancer. A team of scholars from the School of Chinese Medicine (SCM) of Hong Kong Baptist University (HKBU) devoted

their efforts to the development of a new generation of smart anti-cancer drug molecules. The tumour-specific aptamer-drug conjugate they developed performs well in the treatment of tumours and reduces possible toxic side-effects. The research findings were recently published in the internationally renowned academic journal *Nature Communications*.

The research team is led by Dean of SCM Professor Lyu Aiping together with Director of the Technology Development Division and Associate Director of the Teaching and Research Division of SCM Professor Zhang Ge.

Professor Lyu explained that since [chemotherapy drugs](#) could not distinguish cancer cells from normal cells, both are damaged during treatment. This not only limits the therapeutic effect of chemotherapy drugs but also creates certain side-effects on patients. To address this problem, the research team connected a tumor-targeting [aptamer](#) with a plant-derived cytotoxic [drug](#) to form a novel tumor-specific aptamer-drug conjugate.

Aptamers are single strand oligonucleotides that could form 3-D structures and bind to specific cell types or proteins. They have been widely used for targeted drug delivery of small molecules and siRNAs due to their advantages, such as good water solubility, low immunogenicity, high permeability and stability.



Comparison of the therapeutic effect between nucleolin aptamer-paclitaxel conjugate and other types. Credit: HKBU

To date, nucleolin aptamer has been proven safe and tumor specific. By conjugating nucleolin aptamer with a first-line chemotherapy drug paclitaxel into one molecule, the aptamer could improve both water solubility and tumor-targeting ability of the conjugated paclitaxel. By enhancing the delivery of drugs via body fluid to the different parts of the human body, the therapeutic effect is therefore strengthened.

Professor Zhang Ge said the research team developed a nucleolin aptamer-paclitaxel conjugate with good water solubility. An enzyme-

sensitive linker was utilised to connect the aptamer and paclitaxel. The linker remained stable in the circulation, and broke inside tumor cells and released paclitaxel for action. The results showed that the conjugate exhibited excellent antitumor activity and decreased toxicity in the experiments using a mouse model.

The research paper titled "A water-soluble nucleolin aptamer-paclitaxel conjugate for tumor-specific targeting in ovarian cancer" was recently published in the academic journal *Nature Communications*.

**More information:** Fangfei Li et al, A water-soluble nucleolin aptamer-paclitaxel conjugate for tumor-specific targeting in ovarian cancer, *Nature Communications* (2017). [DOI: 10.1038/s41467-017-01565-6](https://doi.org/10.1038/s41467-017-01565-6)

Provided by Hong Kong Baptist University

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