

Plant metabolite promises more effective chemotherapy

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Credit: a7880s

Combining a new synthetic apigenin compound with existing anticancer drug treatments can reverse drug resistance, say researchers at The Hong Kong Polytechnic University (PolyU). The compound can also improve

the absorption of cancer drugs in the digestive system, allowing patients to take some anticancer drugs orally rather than intravenously for the first time.

Chemotherapy treatments sometimes fail because of [drug](#) resistance. One common resistance mechanism takes the form of a "drug efflux": a kind of internal pump that helps cancer cells get rid of attacking drugs.

PolyU researchers studying efflux say they have found a way to stop this pump mechanism from expelling drugs by using a naturally occurring "polyphenol" called apigenin, which is commonly found in plants and vegetables. Plant polyphenols are metabolic by-products that help the growth and development of plants, commonly through protecting them from pests and pathogens.

The team chemically linked two apigenin compounds together, forming a dimer, which fits into the two similarly shaped halves of the pump. Using cell and animal studies, they demonstrated that the new apigenin dimer was highly effective in reversing cancer drug resistance by inhibiting the pump.

Based on this success, the PolyU team has developed a large compound library of improved apigenin dimers, each with a different structure. Significantly, they have found that some dimers can reverse the highest level of [drug resistance](#) found in [cancer stem cells](#).

"It is a breakthrough in tackling multidrug resistance in cancer," says PolyU applied biologist Larry Chow. "Drug resistance in cancer [stem cells](#) is one of the most difficult problems in effective chemotherapy and we have found a way to reverse it using our new generation of dimers," he says. The team's work on treating cancer stem cells has not yet reached the stage of human clinical trials.

PolyU has patented the development of its synthetic apigenin and signed a licensing agreement with Kinex Pharmaceuticals, a U.S.-based global company specialising in [cancer](#) treatment. Kinex will be further developing the apigenin dimers for use in improving the oral bioavailability of [cancer drugs](#).

Provided by Hong Kong Polytechnic University

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