

Researchers identify promising new biologics for obesity-related diseases

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The two HKU research teams. (From left to right) Mr Yuanxin Li (Department of Pharmacology and Pharmacy), Professor Yu Wang (Department of Pharmacology and Pharmacy), Dr Yiwei Zhang (Department of Pharmacology and Pharmacy), Mr Hongxiang Wu (Research Division for Chemistry and Department of Chemistry) and Professor Xuechen Li (Research Division for Chemistry and Department of Chemistry). Credit: The University of Hong Kong

The research teams at the University of Hong Kong led by Professor Xuechen Li from the Research Division for Chemistry and Department of Chemistry, and Professor Yu Wang from the Department of Pharmacology and Pharmacy, reported a synthetic biotherapeutics with promising anti-tumor, insulin sensitizing and hepatoprotective activities in the *Journal of the American Chemical Society*.

Obesity is a global pandemic associated with a significantly reduced life expectancy, it also increases the risk of type 2 diabetes, hypertension, coronary heart disease, stroke, chronic kidney disease and cancer. Adiponectin, as a protein hormone and adipokine, regulates [glucose levels](#) and improve [lipid metabolism](#), and is a major player in the pathogenesis of obesity, insulin resistance and [metabolic syndrome](#). Obese patients have low adiponectin levels, a condition known as hypoadiponectinemia, which contributes to increase risks of cardiovascular, metabolic diseases as well as aggressive development of malignancies with poor prognoses. Adiponectin supplementation is a long-sought-after strategy for the prevention and treatment of cancer and metabolic diseases, especially in obese patients. However, the adiponectin application in therapy has been hampered by the difficult production of human adiponectin.

The teams have been working on the development of synthetic compounds which can mimic the bioactivity of adiponectin over the past seven years. Finally, they developed an efficient synthetic approach to produce the adiponectin-derived glycopeptides that exhibit potent anti-tumor, insulin-sensitizing and metabolic activities in various mouse models. The products hold greater potentials for [clinical application](#) in obesity and related medical complications, such as type 2 diabetes, hypertension, [coronary heart disease](#), stroke, chronic kidney disease and cancer.

Professor Li and Professor Wang believe that this finding opens the door to explore the opportunity of using the synthetic glycopeptide as a potential adiponectin downsized mimic supplementary in clinical treatment. The apparent advantage of these synthetic glycopeptides is that they can be readily produced by chemical process. The two teams are continuing to apply for [research grants](#) which can support them to further evaluate the potential of these agents in preclinical studies for drug development.

More information: Hongxiang Wu et al, Chemical Synthesis and Biological Evaluations of Adiponectin Collagenous Domain Glycoforms, *Journal of the American Chemical Society* (2021). [DOI: 10.1021/jacs.1c02382](#)

Provided by The University of Hong Kong

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