

# Reducing large proteins to small molecules yields more affordable drugs

December 5 2013, by Bronwyn Adams

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Dr Bob Reid

(Phys.org) —University of Queensland researchers have pioneered a drug development technique that could pave the way for a new class of low-cost medicines.

The researchers, led by Professor David Fairlie and Dr Robert Reid from UQ's Institute for Molecular Bioscience (IMB), designed a technique that reduces large proteins to small molecules suitable for use as drugs.

Professor Fairlie said the result was a smaller, more affordable version of a powerful human inflammatory [protein](#), complement protein C3a, that helps defend against disease.

C3a costs thousands of dollars per milligram to manufacture commercially and degrades in minutes in blood, making it too expensive and unstable to be easily used in medicines.

The researchers have designed a small molecule that retains the same potent activities of C3a but is much cheaper and more stable for [drug development](#).

"Despite the importance of proteins to nearly every function in the body, their use in science, industry and medicine is significantly restricted by their high cost and instability," Professor Fairlie said.

"A holy grail in chemistry has been to find a way to reduce large proteins down to much smaller, simpler and cheaper molecules with the same activities.

"We have done exactly that, opening up exciting new avenues for chemists to downsize valuable human proteins and obtain affordable new diagnostics and drugs for the detection and treatment of human diseases," he said.

Dr Reid said the team had identified the key components of the protein that fought disease.

"We have developed a way of using chemical scaffolds to control the molecule's shape and reproduce protein functionhe said.

The research, published in leading scientific journal *Nature Communications*, was supported by the National Health and Medical Research Council and the Australian Research Council.

Provided by University of Queensland

Citation: Reducing large proteins to small molecules yields more affordable drugs (2013, December 5) retrieved 19 July 2024 from <https://phys.org/news/2013-12-large-proteins-small-molecules-yields.html>

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