

Researchers' world first reveals structure of important drug target

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Credit: Monash University

Monash University researchers have used a novel technique to reveal the structure of an important drug target, opening the way for improved treatments of chronic diseases such as osteoporosis, diabetes and obesity.

Treatments for such [chronic diseases](#) all target Class B G protein-coupled-receptors, however, there are large gaps in our knowledge of how these receptors function. In part, this stems from their size. They are so small that only in the past few years has technology advanced to a stage where researchers are beginning to be able to "solve the structure" – to attain an understanding of what these receptors look like.

This is important because knowing how the receptors are structured helps us understand how they work. This knowledge in turn can enable the design of drugs that target the receptor more accurately and have fewer side effects.

The structure solved by Monash Institute of Pharmaceutical Sciences (MIPS) researchers and their collaborators is that of the calcitonin receptor,

a receptor targeted by treatments for hypercalcemia and Paget's disease (a bone disorder). The breakthrough is significant not just because of the additional knowledge it reveals, but also because of the method used to uncover it.

This is the first time that a cryo-electron microscope has been used to reveal the structure of a G protein-coupled-receptor, and the first time that the full-length [structure](#) of a receptor in this class has been solved.

"The fact that we have been able to use [cryo-electron microscopy](#) to arrive at these important findings is a vindication of investment to date in this area, and makes a strong case for further investment in the future," MIPS Doctor Denise Wootten said.

"The information revealed by this study should ultimately enable the design of better drugs to treat not only diseases regulated by the calcitonin receptor but also those involving related [receptors](#) including diabetes, obesity, osteoporosis and migraine" Head of Drug Discovery Biology at MIPS, Professor Patrick Sexton said.

The research has been published in the journal *Nature*.

More information: Yi-Lynn Liang et al. Phase-plate cryo-EM structure of a class B GPCR–G-protein complex, *Nature* (2017). [DOI: 10.1038/nature22327](https://doi.org/10.1038/nature22327)

Provided by Monash University

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