

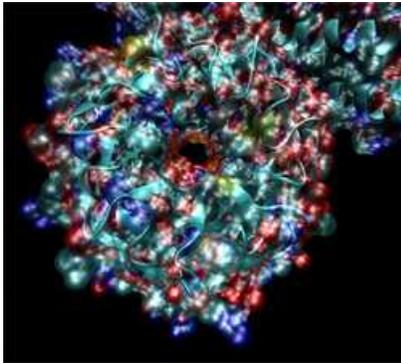
News&views

Biomedicine and Molecular Biology

Revelation of the polyglot of a basic protein in cell communication

G proteins are involved in transmitting information from the outside to the inside of cells. These are capable of speaking with different molecules to trigger specific cell responses. Researchers at IRB Barcelona have found where the polyglot capacity resides of these proteins, the combination of which offers new possibilities for the creation of specific drugs. The work was published in the journal 'Proceedings of the National Academies of Sciences.

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G protein fragment that changes shape depending on the protein to which it is attached.
Photo: IRB Barcelona

Researchers from the IRB Barcelona lead by Ernest Giralt have worked closely with Rochester University and Brigham Young University, United States, and the University of Barcelona.

During the information journey from the outside to the inside of cells there are three components involved: the receptor GPCR (G protein-coupled receptors); G proteins and the set of effector molecules that provoke appropriate responses in each case. Suppose someone calls on the intercom of Mrs Pepeta and tells her it has begun to rain. This someone would be the external molecule that binds to the receptor. The intercom that connects the exterior with the interior would be the receptor binding the protein G, and Mrs Pepeta would represent the protein G that presses the button to raise the canopy. Finally, this button would be the effector molecule which is in charge of lifting it", Giralt describes.

One of the questions that scientists ask is how the same protein G is able to generate different responses depending on the signals received. In this paper, researchers show how the $\beta\gamma$ subunit of G protein adopts different three-dimensional structures depending on the effector molecule to which it is linked. "The G protein is like a dancer who takes different forms according to its dance partner", says Giralt.

Researchers believe that this variability in the three-dimensional structure causes different cell responses depending on the context. Alterations in these responses can cause cancer or inflammatory diseases. Until now, drugs used to treat some of these diseases bind to GPCR or to the effector molecules. The future of these studies is to know the exact forms of the G protein, to be able to create new drugs that block harmful responses for the cells in a specific way.