

Mechanism of sculpting the plasma membrane of intestinal cells identified

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The research group of Professor Pekka Lappalainen at the Institute of Biotechnology, University of Helsinki, has identified a previously unknown mechanism which modifies the structure of plasma membranes in intestinal epithelial cells. Unlike other proteins with a similar function, the new protein – named 'Pinkbar' by the researchers - creates planar membrane sheets.

Further research investigates the potential connection of this [protein](#) with various intestinal disorders. The study was published in the prestigious *Nature Structural & Molecular Biology* journal.

A dynamic [plasma membrane](#) surrounds all eukaryotic cells. Membrane plasticity is essential for a number of cellular processes; changes in the structure of the plasma membrane enable cell migration, cell division, intake of nutrients and many neurobiological and immunological events.

Earlier research has shown that certain membrane-binding proteins can 'sculpt' the membrane to generate tubular structures with positive or negative curvature, and consequently induce the formation of protrusions or invaginations on the surface of the cell. These membrane-sculpting proteins are involved in various vital cellular processes and can control the shape of the plasma membrane with surprising precision. Many of them have also been linked to severe diseases such as cancer and neurological syndromes.

Identified by Anette Pykäläinen, a member of Professor Lappalainen's

group who is currently finalising her dissertation, the new membrane sculpting protein has a different mechanism than other proteins studied previously. Instead of generating positive and negative curvature, the Pinkbar protein is able to produce planar membrane sheets.

Lappalainen's group determined the membrane-sculpting mechanism of Pinkbar in collaboration with an American research group. In humans, Pinkbar is only found in [intestinal epithelial cells](#) where it may be involved in the regulation of intestinal permeability. In the future, it will be important to identify the exact physiological function of Pinkbar in intestinal [epithelial cells](#) and to study the possible links of this protein to various intestinal disorders.

Provided by University of Helsinki

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