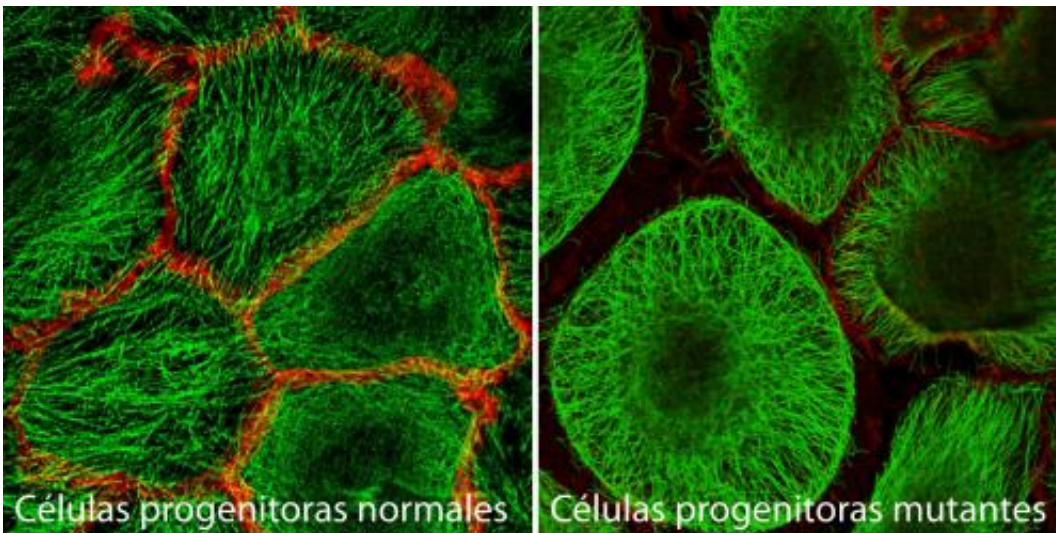


Study finds a 'molecular scaffolding' that maintains skin structure and organisation

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Mutant epidermal stem cells lose the connections to their neighbours (red, right) compared to normal stem cells (red, left). Credit: CNIO

The human body is daily exposed to external assaults such as bacteria, ultraviolet light or chemical agents. Skin, the largest organ of the body, is the first line of defense against these agents. Skin performs this function thanks to the close connections established between its cells (e.g. adherens junctions). The loss of cell adhesion between these cells is related to inflammatory diseases and cancer, hence the special interest in this area of research over the past years.

A study by the Spanish National Cancer Research Centre (CNIO),

featured on the cover of the *Journal of Cell Biology*, shows how interactions between [skin stem cells](#)—the cells responsible for the constant renewal of skin—maintain the architecture of this organ. "We knew that these junctions were important in skin stem cells but the cellular components involved in their structure and function were not yet understood", says Mirna Pérez-Moreno, head of the Epithelial Cellular Biology Group that led the study.

Using [skin cells](#) derived from mice, researchers have discovered that one of the key elements in the formation and stabilisation of these junctions are microtubules, tubular structures that are part of all cells and that serve as pillars to maintain their form and function.

"We have seen for the first time that skin stem-cell microtubules connect with cell-cell junctions to form velcro-like structures that hold the cells together", says Marta Shahbazi, a researcher on Pérez-Moreno's team and the first author of the study.

The connection between these two cellular components—microtubules and cell-cell junctions—occurs via the interaction between the CLASP2 and p120 catenin proteins, linked to microtubules and cell junctions respectively.

"We found that the absence of CLASP2 or p120 catenin in epidermal [stem cells](#) caused a loss of their adhesion, and therefore the structure of these cells", says Shahbazi.

"Our results will open up new paths for exploring how these proteins regulate skin physiology", says Pérez-Moreno, adding that this knowledge will be "important for the possible development of future regenerative or anti cancer therapies".

Provided by Centro Nacional de Investigaciones Oncologicas (CNIO)

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