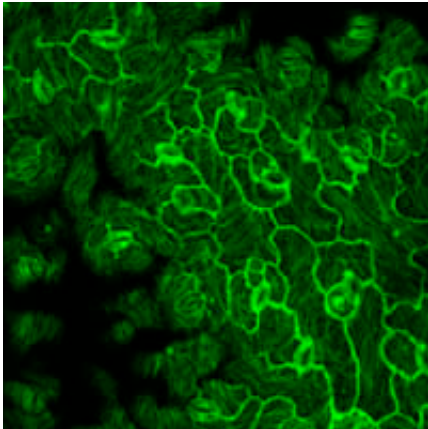


Researchers Unlock Mechanism Creating Jigsaw Puzzle-Like Plant Cells

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Researchers at the University of California, Riverside have unlocked the molecular give and take that allows cells in thin structures such as leaves to develop in a jigsaw-like pattern, providing the leaf a surprising degree of strength. The findings were published in today's edition of the journal *Cell*.

Image: Arabidopsis leaf microtubules

Zhenbiao Yang, a professor of plant cell biology at the UCR's Center for Plant Cell Biology and Institute for Integrative Genome Biology, worked with a team of researchers which included Geoffrey Wasteneys from the University of British Columbia, Vancouver; fellow UCR colleagues Ying

Fu, Ying Gu, and Zhiliang Zheng.

The findings, described in a paper titled “Arabidopsis Interdigitating Cell Growth Requires Two Antagonistic Pathways with Opposing Action on Cell Morphogenesis,” explained a complicated and coordinated series of chemical interactions in a group of cellular proteins, known as GTPases (guanosine triphosphatases) that act as molecular switches, which regulate how plant cells grow into interlocking patterns resembling jigsaw puzzle pieces.

These proteins tell one part of a cell to grow outward while telling its neighbor to recede or indent itself in a finely tuned biological dance. The results are structures that, despite their delicate appearance and slenderness, provide the strength necessary to allow the plant to grow and thrive.

The findings point out that these distinct signals play a critical role in the development of leaf cell walls and leaf structures in a controlled and ordered way and that genetically over expressing one or the other leads to cells lacking the interlocking jigsaw puzzle appearance.

While the researchers unlocked a fascinating mechanism of biochemical crosstalk that coordinates cells into tissues, a deeper understanding of how plant cells chemically talk to each other to grow or recede in an ordered way remains unclear.

Source: University of California, Riverside

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