Laboratory of Interdisciplinary Biology

Graduate School of Science

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Treasure every encountering with a question!

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(Field: plant physiology, cell biology, developmental biology)

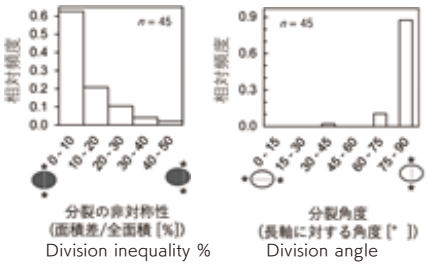
The mechanisms of how a multicellular organism's body is formed are complex as they have been acquired through repeated innovations which require a lot of time, and they remain largely unknown. Tetsuhiro Asada is working on elucidation of a basis of the capability of plants generating an organized tissue in their bodies.

In a plant body, rigid cell walls made by spending photosynthesized sugar fix cell positions, and tissues' rough architecture is determined by how cell walls are arranged. Arranging cell walls for a plant tissue is, in principle, possible only by using the opportunity for a cell to divide and only through affecting the placement of new cross-walls.

Consequently, the formation of a plant tissue heavily relies on cells' selection of the plane of cell division. What is the logic and mechanism for controlling division-plane selection to generate an organized plant tissue?

An immature plant tissue with cells that are going to divide should conceives some information which helps the cells to select appropriate division planes. Clarifying what is the information and how each cell deals with it, which is key to answering the above question, requires grasping the tendency of default division-plane selection, that is, selection not influenced by the tissue-level information, paradoxically. The author pointed out this and attempted to characterize the default selection using isolated tobacco cells (figure).

Anyone who is interested in development of an organism responsible for terrestrial primary production is welcome to attend our activity!



Isolated tobacco cells with a highly symmetric shape tend to select a division plane which divides the parental cell equally (left) and is perpendicular to the cell's long axis (right).

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