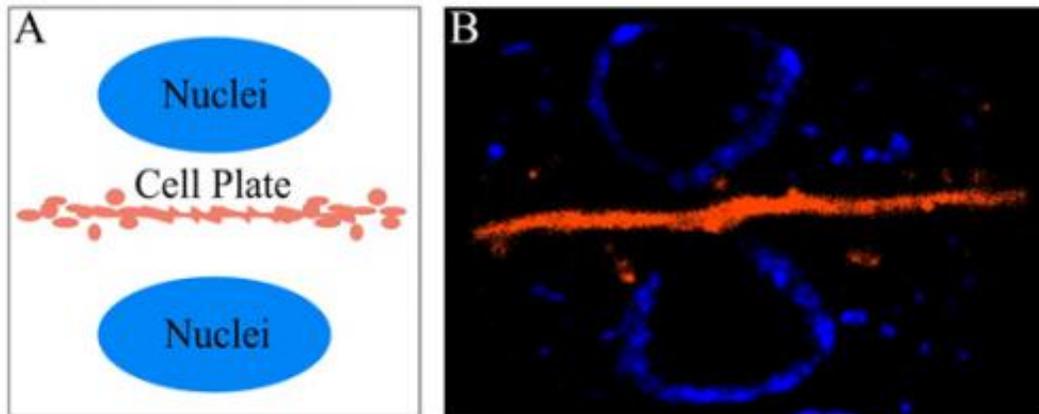


How sterols influence cell division in plants

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Marcia Frescatada-Rosa shows that changes in sterol composition and concentration affect the localization of a specific protein, which is required for cell plate formation during cell division of plants. The dissertation will be publicly defended on October 4 at Umea University.

Every cell is surrounded by a membrane that separates the cellular content from the surrounding environment. Sterols are components of cellular membranes. Changes in sterol composition perturb the execution of [cell division](#) in diverse organisms such as animal and plants. In her doctoral dissertation Márcia Frescatada-Rosa investigates how sterols affect the formation of the cell plate during cell division in plants.

Sterols are involved in the establishment of distinct domains within the

cellular membrane, which appear to be essential for the regulation of processes such as cell division. The last step of cell division involves separation of the cytoplasm and is termed cytokinesis. In [plants](#), cytokinesis requires the formation of a structure named cell plate, between the daughter nuclei.

Cell plate formation depends on membrane fusion and membrane removal. In *Arabidopsis thaliana*, the protein KNOLLE is necessary for [membrane fusion](#) during cytokinesis while removal of excess membrane is mediated by a mechanism termed endocytosis that involves a protein named DRP1A.

Márcia shows that a correct sterol composition is required for proper removal of KNOLLE from the cell plate. Removal of KNOLLE from the cell plate is mediated by a clathrin- and DRP1A-dependent endocytosis. Marcia's work demonstrates that correct sterol concentration and composition is required for the accumulation of DRP1A at the cell plate and the establishment of distinct domains within the cell plate. These domains likely function as platforms where DRP1A and other components of the endocytic machinery assemble.

Thus, by regulating the assembly or activity of DRP1A, [sterols](#) modulate the localization of KNOLLE thus affecting its function during cell division.

Márcia Frescatada-Rosa was born and raised in Portugal, where she received her Engineering degree in Agronomy in 2004 and worked as a researcher in the Center for Botany applied to Agriculture before coming to Umeå in 2008.

More information: Read the whole or parts of the dissertation at: urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-80030

Provided by Umea University

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