

Inhibition of an analog-sensitive version of the yeast MAPK Slt2 prevents the appearance of multibudded cells in mutants lacking the PP2C phosphatase Ptc1 under stress conditions.

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Mitogen-Activated Protein Kinase (MAPK) signaling pathways are evolutionarily conserved in eukaryotic organisms and play a central role in the transduction of different stimuli to responses that allow cells to quickly adapt for enhancing fitness and survival. They include a cascade of three protein kinases that are sequentially activated by phosphorylation and finally leads to distinct outputs, such as changes in gene expression. Protein phosphatases are negative regulators that modulate the intensity and the duration of the activation of these pathways. MAPK activity controls diverse processes that range from cellular proliferation and differentiation to cell cycle arrest.
In response to cell wall damage, as well as during polarized growth, Slt2, the *Saccharomyces cerevisiae* MAPK of the cell wall integrity (CWI) pathway, ensures the maintenance of cell shape and cell wall stability and also the timely progression through the cell cycle. By using its protein adaptor Nbp2, the protein phosphatase Ptc1 negatively regulates the CWI pathway. Mutants lacking Ptc1 exhibit numerous phenotypic defects including strong sensitivity to cell wall-damaging agents and delay in organelles inheritance. Moreover, *ptc1* mutants display a multibudding phenotype when grown at 37ºC.
We have found that not only thermal stress but other cell wall stresses lead to the same multibudding phenotype both in *ptc1* and *nbp2* mutants, which show an alteration of the septin ring dynamics in daughter cells. Inhibition of an analog-sensitive version of Slt2 prevents multibudding. We have identified several genes that, when overexpressed, relieve or aggravate this *ptc1* morphogenetic defect.

Biography

The biologist Gema González Rubio has obtained her Master´s degree in "Microbiology and Parasitology: Research and Investigation" at the Complutense University of Madrid, Spain, in 2015. She is currently doing her doctoral thesis research in the lab of Professor María Molina to understand the mechanisms that regulate MAPK signal transduction in *Saccharomyces cerevisiae*.

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