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# Comparison of morphogenetic networks of filamentous fungi and yeast.

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## Abstract

Fungi generally display either of two growth modes, yeast-like or filamentous, whereas dimorphic fungi, upon environmental stimuli, are able to switch between the yeast-like and the filamentous growth mode. Signal transduction pathways have been elucidated in the budding yeast Saccharomyces cerevisiae, establishing a morphogenetic network that links cell-cycle events with cellular morphogenesis. Recent molecular genetic studies in several filamentous fungal model systems revealed key components required for distinct steps from fungal spore germination to the maintenance of polar hyphal growth, mycelium formation, and nuclear division. This allows a mechanistic comparison of yeast-like and hyphal growth and the establishment of a core model morphogenetic network for filamentous growth including signaling via the cAMP pathway, Rho modules, and cell cycle kinases. Appreciating similarities between morphogenetic networks of the unicellular yeasts and the multicellular filamentous fungi will open new research directions, help in isolating the central network components, and ultimately pave the way to elucidate the central differences (of many) that distinguish, e.g., the growth mode of filamentous fungi from that of their yeast-like relatives, the role of cAMP signaling, and nuclear division.



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## Publication Types, MeSH Terms, Substances

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