P041 Cleavage-furrow formation during yeast cytokinesis

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It is widely believed that the contraction of an actomyosin ring (AMR) results in the membrane invagination that forms the cleavage furrow during cytokinesis in animal and fungal cells. In *Saccharomyces cerevisiae*, the AMR functions in conjunction with the formation of a chitinous primary septum (PS). Null mutations of *MYO1* (the only myosin II gene) block AMR formation but are nonetheless nonlethal. Electron microscopy of *myo1*Δ cells revealed that PS-like structures could still form but were typically misoriented, suggesting that the AMR is unnecessary for membrane invagination and instead only guides its direction. We found that increased expression of *CYK3*, encoding an SH3- and transglutaminase-domain protein that appears to function downstream of the IQGAP Iqg1p, could suppress *myo1*Δ phenotypes and caused a proliferation of PS-like structures, whereas a *cyk3*Δ mutation reduced the rate of furrow ingression by 2.5-fold; thus, Cyk3p may facilitate furrow formation in an AMR-independent manner. We also found that Cyk3p forms a complex with Hof1p, which contains a domain (F-BAR) that has recently been reported to promote membrane deformation. A *hof1*Δ mutant displays partial delocalization of Cyk3p, abrupt breakage of the AMR during contraction, and asymmetric PS formation. These results suggest that Cyk3p and Hof1p function together to control membrane deformation during cleavage-furrow formation.