

DOI:  
10.1038/nrm2383



Ingression, the process whereby the plasma membrane pinches a cell into two daughter cells, is the penultimate step of cytokinesis. Although contraction of the actomyosin ring — a complex that defines the site of ingression — is thought to cause the plasma membrane to pinch, the process is poorly understood. Reporting in *Nature Cell Biology*, Sanchez-Diaz and colleagues have identified a novel protein, Inn1, that is required for ingression.

Previous studies have identified all of the proteins that are essential for *Saccharomyces cerevisiae* viability. Focusing on the subset of these for which no function is known, the authors constructed fusion proteins that allowed each essential protein to be depleted rapidly following heat treatment. Inactivation of one protein, which the authors named Inn1, produced a distinct phenotype: cells proceeded through S phase and mitosis, but did not divide.

In a series of experiments, the authors showed that Inn1 localizes to the actomyosin ring and co-purifies with two ring components, Hof1 and Iqg1. Moreover, Inn1 is not required for the assembly or contraction of the ring, leading the authors to suspect that it might link contraction of the ring to ingression of the plasma membrane. Using time-lapse videos, the authors observed that contraction of the actomyosin ring resulted in ingression in control cells, except upon inactivation of Inn1. Specifically, the contracting ring appeared to detach from the plasma membrane in the absence of Inn1.

The N terminus of Inn1 possesses a membrane-binding domain called C2, whereas the C terminus is largely unstructured. Point mutations indicated that the C2 domain is required for ingression, whereas the unstructured C-terminal region is needed to localize Inn1 to the actomyosin ring. Moreover, fusion of the C2 domain to Hof1 allowed ingression to proceed in the absence of Inn1. So, recruitment of the C2 domain to the actomyosin ring appears to be a key aspect of the function of Inn1 during ingression.

Given that other yeasts express Inn1 orthologues and that mammals express several proteins with C2 domains, it will be interesting to determine which, if any, of these proteins are involved in ingression in other species.

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**ORIGINAL RESEARCH PAPER** Sanchez-Diaz, A. et al. Inn1 couples contraction of the actomyosin ring to membrane ingression during cytokinesis in budding yeast. *Nature Cell Biol.* 16 March 2008 (doi: 10.1038/ncb1701)

**FURTHER READING** Lemmon, M. A. Membrane recognition by phospholipid-binding domains. *Nature Rev. Mol. Cell Biol.* 9, 99–111 (2008)

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