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Mechanical feedback stabilizes budding yeast morphogenesis SAMHITA BANAVAR, MICHAEL TROGDON, LINDA PETZOLD, OTGER CAMPAS, Univ of California - Santa Barbara — Walled cells have the ability to remodel their shape while sustaining an internal turgor pressure that canreach values up to 10 atmospheres. This requires a tight and simultaneous regulation of cell wall assembly and mechanochemistry, but the underlying mechanisms by which this is achieved remainunclear.Using the growth of mating projections in budding yeast (S. *cerevisiae*) as a motivating example, we have developed a theoretical description that couples the mechanics of cell wall expansion and assembly via a mechanical feedback. In the absence of a mechanical feedback, cell morphogenesis is inherently unstable. The presence of a mechanical feedback stabilizes changes in cell shape and growth, and provides a mechanism to prevent cell lysis in a wide range of conditions. We solve for the dynamics of the system and obtain the different dynamical regimes. In particular, we show that several parameters affect the stability of growth, including the strength of mechanical feedback in the system. Finally, we compare our results to existing experimental data.

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