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Cell morphology, budding propensity and cell death of *Saccharomyces cerevisiae* **at high hydrostatic pressure** KHANH NGUYEN, JEFFREY LEWIS, PRADEEP KUMAR, University of Arkansas — A large biomass on earth thrives in extremes of physical and chemical conditions including high pressure and temperature. Budding yeast, *S. cerevisiae*, is a eukaryotic model organism due to its amenability to molecular biology tools. To understand the effects of hydrostatic pressure on a eukaryotic cell, we have performed quantitative experiments of the growth, the propensity of budding, and cell death of *S. cerevisiae* in a wide range of pressures. An automated image analysis method for the quantification of the budding index was developed and applied along with a continuum model of budding to investigate the effects of pressure on cell division and cell morphology. We find that the growth, the budding propensity, the average cell size, and the ellipticity of the cells decrease with increasing pressure. Furthermore, large hydrostatic pressure led to the small but finite probability of cell death. Our experiments suggest that the decrease of budding propensity arises from cellular arrest at the cell cycle checkpoints during different stages of cell division.

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