

Regulation of cytokinesis to ensure accurate chromosome separation

Research Topics

- Budding yeast as a model system for cell division
 - Budding yeast, like other eukaryotes, divide using an actomyosin contractile ring
 - Budding yeast have a single gene, IQG1, which is homologous to mammalian IQGAP1, 2, and 3
 - Human IQGAPs are overexpressed in cancer cells
- Regulation of cytokinesis via protein phosphorylation
 - Mutants of Iqg1 that prevent phosphorylation cause actin rings to form earlier than usual in the cell cycle and cause a failure of contraction
 - Current studies aim to investigate the role of phosphorylation in regulating Iqg1 interactions with actin and other proteins
- Coordination of mitosis and cytokinesis
 - Proteins in the mitotic exit network also regulate cytokinesis
 - Current research is investigating the role of the Dbf2 kinase
- Increasing student learning and engagement
 - How does a flipped classroom improve student learning?
 - What factors motivate students to learn?

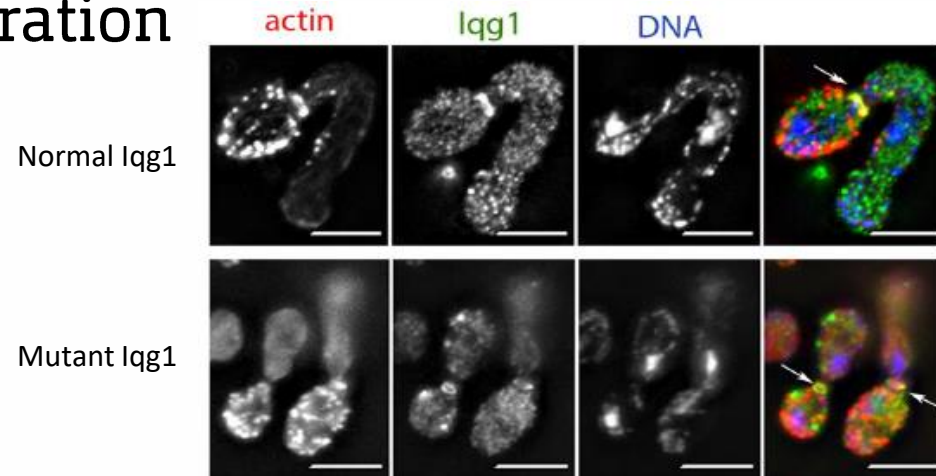
Facilities Inverted Epifluorescent microscope

PoC

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separation



Iqg1 and actin are localized to the site of cytokinesis in budding yeast, as in other eukaryotic cells. When Iqg1 is mutant and cannot be phosphorylated, the timing of actin ring formation is affected, occurring in cells that have not yet completed mitosis (cell on right in bottom right panel)

Keywords

- Cytokinesis, mitosis, cell division, actin, cytoskeleton, microscopy, phosphorylation, aneuploidy, cancer

Recognitions/Significant achievements

- Miller, D.P., Hall, H., Chaparian, R., Mara, M., Mueller, A., Hall, M.C., and **Shannon, K.B.** (2015) Dephosphorylation of Iqg1 by Cdc14 regulates cytokinesis in budding yeast *Molecular Biology of the Cell* vol. 26 no. 16
- Faculty Achievement Award 2017
- Mentored students who won 1st place poster and oral presentation Sciences Undergraduate Research Symposium, 2016, 2017 and 2018