High-throughput quantitative analysis of mitotic defects in fission yeast using Imaging Flow Cytometry

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Abstract

In this study, we introduce a novel approach for the high-throughput quantitative analysis of mitotic defects in the fission yeast *Schizosaccharomyces pombe* using Imaging Flow Cytometry (IFC). Fission yeast is a valuable model organism for cell cycle research, and the 'cut' phenotype, indicative of mitotic catastrophe, has been instrumental in discovering cell cycle regulators. Traditional fluorescence microscopy methods for quantifying 'cut' events suffer from subjectivity and limited throughput. Our IFC pipeline overcomes these limitations by automating the detection of 'cut' cells based on the unique characteristic of daughter cell nuclei becoming trapped in the cell wall during aberrant mitosis. We demonstrate the pipeline's effectiveness using wild-type and mutant strains, with results validated against manual scoring. Our study establishes IFC as a powerful tool for investigating mitotic fidelity in fission yeast, with implications for advancing cell biology research.

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