

P019 Abscission control by Aurora B
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Abscission defines the end of cytokinesis by complete separation of postmitotic daughter cells. Its temporal control and the cellular dynamics at the midbody in animal cells is poorly understood. Here, we developed quantitative live cell assays to monitor cytoskeletal and membrane dynamics during abscission. Using automated confocal time-lapse microscopy and photoactivation approaches, we identified Aurora B as a master regulator of abscission. Aurora B has been previously shown to promote midbody assembly, and its budding yeast homolog Ipl1 controls the timing of cytokinesis completion in the NoCut pathway. We thus hypothesized that Aurora B inactivation might provide the trigger for midbody disassembly and drive abscission. Consistent with this idea, chemical inactivation of Aurora B after midbody formation accelerated midbody disassembly and at the same time promoted abscission. In contrast, drug-induced disassembly of midbody microtubules alone did not directly lead to abscission. This suggests that Aurora B inactivation triggers both midbody microtubule disassembly and at the same time promotes membrane dynamics necessary for abscission. We found that prolonged Aurora B activity delays abscission in cells with chromosome segregation errors, which is essential to avoid tetraploidization through cleavage furrow regression.