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**Brownian dynamics simulation of fission yeast mitotic spindle formation** CHRISTOPHER EDELMAIER, ROBERT A. BLACKWELL, OLIVER M. SWEEZY, MATTHEW A. GLASER, MEREDITH D. BETTERTON, Univ of Colorado - Boulder — The mitotic spindle segregates chromosomes during mitosis. The dynamics that establish bipolar spindle formation are not well understood. We have developed a computational model of fission-yeast mitotic spindle formation using Brownian dynamics and kinetic Monte Carlo methods. Our model includes rigid, dynamic microtubules, a spherical nuclear envelope, spindle pole bodies anchored in the nuclear envelope, and crosslinkers and crosslinking motor proteins. Crosslinkers and crosslinking motor proteins attach and detach in a grand canonical ensemble, and exert forces and torques on the attached microtubules. We have modeled increased affinity for crosslinking motor attachment to antiparallel microtubule pairs, and stabilization of microtubules in the interpolar bundle. We study parameters controlling the stability of the interpolar bundle and assembly of a bipolar spindle from initially adjacent spindle-pole bodies.

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