The microtubule-dynein mechanism by which the centrosome is centered in the cell was investigated by a combination of experiment and computational modeling. In images of BS-C-1 cells (left) hot–cold colors illustrate high–low microtubule density. Simulations are shown on the right (gray circle, cell periphery; green lines, microtubules; blue dot, the centrosome). The centrosome is centered in a control cell (top). In a cell in which dynein is inhibited, the centrosome is destabilized and moves to the cell edge (bottom). The study reveals that dynein motors pulling on the sides of the microtubules generate the centering force assisted by actomyosin contraction and resisted by a strong de-centering microtubule pushing force. See the article by Zhu et al. on p. 4418 of this issue of MBoC. (Image: Jie Zhu and Alex Mogilner, University of California at Davis; Anton Burakov, Moscow State University, Moscow, Russia; and Vladimir Rodionov, University of Connecticut Health Center).

Molecular Biology of the Cell

The Philosophy of Molecular Biology of the Cell

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