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Cell Division: Mechanical Integrity with Dynamic Parts

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ABSTRACT

The spindle is the machine that segregates chromosomes at cell division. To perform its job, it must be flexible and dynamic over short timescales, and yet maintain its mechanical integrity over long timescales. How it does so is not understood. How do the spindle's nanometer-scale parts self-organize to form its micron-scale architecture, and how do robust mechanics and function emerge? I will describe our recent efforts combining biophysics and cell biology to address this question. Our work paints a picture of highly mechanically robust cell division machinery, unmatched in its performance by anything we can currently build.

BIO:

Prof. Sophie Dumont joined UCSF's Department of Cell & Tissue Biology as an assistant professor in 2012. Her lab studies the self-organization and mechanics of the macromolecular machines driving cell division. She received her Ph.D. in Biophysics from UC Berkeley working with Carlos Bustamante, and was a postdoctoral Junior Fellow with the Harvard Society of Fellows, working with Tim Mitchison at Harvard Medical school. She has won a number of awards and honors over her career including the the NIH New Innovator Award, NSF CAREER Award, the Margaret Oakley Dayhoff Award of the Biophysical Society, the NIH Pathway to Independence Award and was named a Searle Scholar, Kimmel Cancer Foundation Scholar and a Sloan Research Fellow.