During ovulation in Caenorhabditis elegans, the oocyte enters and stretches the spermatheca. Spermathecal contraction then expels the fertilized embryo into the uterus. Spermathecal contraction is driven by stress fiber–like actomyosin bundles that are parallel to the long axis of each cell. Using 4D confocal microscopy to observe ovulations in live animals expressing labeled actin (red) and myosin (green) (left column), Wirshing and Cram (p. 1937 of this issue of MBoC) show that organization of parallel actomyosin bundles during the first ovulation is largely dictated by myosin activity. In wild-type (WT) spermathecae (top row) myosin is homogeneously distributed throughout the parallel actomyosin bundles. Elevated myosin activity (bottom row) produces hypercontractile spermathecal cells that develop myosin foci in bands extending across multiple bundles. In these spermathecal cells, actin organization is also disrupted. This is highlighted by OrientationJ analysis used to color bundles according to their orientation (right column). WT cells contain primarily vertical bundles (warm colors), while cells with elevated myosin contain populations of misaligned, horizontal actin bundles (cool colors). (Image: Alison C. E. Wirshing and Erin J. Cram, Department of Biology, Northeastern University)