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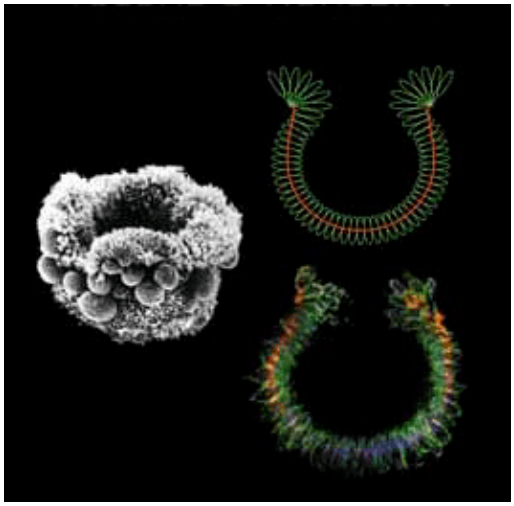

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FEATURES

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ESSAY

ARTICLES

by Gilat Brill and Anat Yarden

- **Apoptosis: A Four-Week Laboratory Investigation for Advanced Molecular and Cellular Biology Students**
  by Susan M. DiBartolomeis and James P. Moné

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On the Cover [Printable Cover]

Inversion is the process by which Volvox embryos turn inside-out to assume the adult configuration. Middle left: A scanning electron micrograph of a Volvox embryo in

early-to-mid inversion. An opening has formed at one pole of the embryo, and four lips of cells flanking the opening have begun curling outward and backward over the rest of the embryo. Top right: A diagrammatic sagittal section of an early-inversion embryo illustrating the role that is played by cell movements and a coherent network of cytoplasmic bridges (continuous red line) in generating the curvature of the cell sheet. Cells near the opening in the embryo form long, thin stalks at their outer ends, and then move inward relative to the cytoplasmic bridge network. This causes neighboring cells to go from being connected at their widest points to being connected at their narrowest points, which forces the cell sheet to curl outward like an opening fan. Lower right: A confocal sagittal section of an embryo stained with antibodies to reveal the locations of microtubules (green), nuclei (blue), and an inversion-specific kinesin (InvA) that is located in the cytoplasmic bridges. A mutation in the gene encoding InvA causes inversion to arrest at an early stage, indicating that this kinesin plays a key role in driving the inversion process. See Nishii et al. (2003) “A kinesin, InvA, plays an essential role in Volvox morphogenesis.” Cell 113: 743–753. Images courtesy of David Kirk, Washington University in St. Louis.