Outcomes of CLEAVAGE CYCLES:

1. Rapid increase in cell number
2. Distribution of egg contents, often asymmetrically, to the cells

Cleavage patterns affected by--

--the amount and location of yolk
--how complete cleavage (cytokinesis) is
--relationship of cleavage planes
--timing of cleavage divisions relative to each other
Worm cleavage --
--point of sperm entry is posterior pole
--sperm centriole organizes microtubules to ferry determinants to front or back
--cytoplasmic “streams” also move molecules around

PAR proteins during cleavage in C. elegans

PAR-3 = orange
PAR-2 = purple

Skn-1 is required to specify pharynx and gut of C. elegans

Cell-Cell Interactions Are Required for the EMS Cell to Form Intestinal Lineage Determinants

Cell-Cell Signaling in the 4-Cell Embryo of C. elegans
Development of a Human Embryo From Fertilization to Implantation

Early Cleavage in Mammals

SEMs of (A) Uncompacted and (B) Compacted 8-cell Mouse Embryos

The Cleavage of a Single Mouse Embryo In Vitro

Hallmarks of the Mid-Blastula Transition:
--N/C ratio approaches 1
--cell cycle lengthens and incorporates G1, G2
--transcription from embryo nuclei activated
--cells become motile