

64. Introduction to Developmental Biology: Pattern Formation and Morphogenesis
1 unit, Mary Baylies December 3, 2025

The principles and molecules that orchestrate development are central for tumorigenesis and metastasis

A small number of signaling pathways regulate intercellular interactions: Receptor tyrosine kinases, Wnt, Notch, TGF-beta, Hedgehog.

These signals control cell identity, proliferation and migration

Concepts in developmental biology

Mosaic versus regulative development

Pattern formation and positional information

Induction and intercellular signaling

Organizers and morphogens

Morphogenesis

Review (to be read before the lecture):

Briscoe J, Small S. 2015 Morphogen rules: design principles of gradient-mediated embryo patterning. *Development*. 2015 Dec 1;142(23):3996-4009. doi: 10.1242/dev.129452. PMID: 26628090

For Discussion:

Cell-supracellular structural relations solve the French Flag Problem without graded molecular control

Clint S. Ko, Ruonan Chen, Nina T. Magid, Katharine Courtemanche, Pearson W. Miller, Alan R. Rodrigues, Amy E. Shyer

bioRxiv 2025.10.24.683925; doi: <https://doi.org/10.1101/2025.10.24.683925>