

Mammalian Development

Networks, Switches, and Morphogenetic Processes

During mammalian development, a fertilized egg divides to form millions of cells in a multitude of different tissues. A complex set of gene expression programs, signaling pathways, and morphogenetic changes control the process to ensure that cells of the right type are generated at the right time and in the right numbers.

This textbook represents a novel approach to developmental biology that provides a conceptual framework for the subject as well as a comprehensive examination of the underlying molecular mechanisms driving embryogenesis. It starts by describing the fundamental principles of transcriptional and mitogenic regulation and the roles of signal transduction and gene networks. It then examines the cellular processes that underpin differentiation and tissue morphogenesis, explaining phenomena such as asymmetric cell division, developmental timing, and tissue patterning. The final section discusses how these are integrated in different tissues, featuring chapters on all the major organs of the body.

The book also includes detailed descriptions of stem cell biology, regenerative medicine, and genomic imprinting, as well as introducing emerging areas and approaches, such as regulatory RNAs and whole genome analyses. It is thus essential reading both for students of cellular and developmental biology and for experts already working in the field.



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