

METHODS IN MOLECULAR BIOLOGY

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Morphogen Gradients

Methods and Protocols

Edited by

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Preface

During embryonic development and tissue growth, progenitor cells receive cues from their environment that instruct them to differentiate according to their spatial location. This positional information is conveyed by molecules called morphogens that form a concentration gradient across the tissue. These morphogens, whether they are secreted peptides, metabolites, or diffusible transcription factors, are produced from a source and travel through the responsive field by passive diffusion, advection, or active cell-to-cell transport. Different concentrations of the morphogen trigger different responses in the receiving cells, leading to a spatial arrangement of cells with specific identities that depend on their distance from the source.

The study of morphogen gradients combines biophysics, cell and developmental biology, and applied mathematics approaches to understand how they form, what their biological functions are, and to predict their behavior in space and time. This book presents methods focusing on the visualization of morphogen gradients, the analysis of their biophysical and biological properties, and the theoretical aspects underlying their functions.

Houston, TX, USA

Julien Dubrulle

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