

A microscopic image of cells, likely in the process of division, showing bright, glowing structures against a dark blue background. The cells are out of focus, creating a bokeh effect.

Current Topics in **Developmental Biology**

Volume 46

Edited by

**Roger A. Pedersen
Gerald P. Schatten**



**Current Topics in
Developmental Biology**

Volume 46

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Cover photograph: Fluorescence micrograph of male and female pronuclei in a mouse zygote. Two condensed sperm nuclei and the second polar body are also visible. For more details see Chapter 5 "Sperm Nuclear Activation during Fertilization" by Shirley J. Wright.

This book is printed on acid-free paper. ∞

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Preface

This volume of *Current Topics in Developmental Biology* will be important to all developmental biologists because it considers the remarkable breadth and depth of significant discoveries in a variety of experimental systems. One of the most significant discoveries has been the molecular basis of axis determination and the breaking of asymmetry during early development. In Chapter 1, Hiroki Nishida, Junji Morokuma, and Takahito Nishikata discuss maternal cytoplasmic factors for the generation of unique cleavage patterns in animal embryos, and they address the classic question of how a differentiated and polarized offspring results from the seemingly homogeneous symmetrical egg. Gastrulation in mammals, which seemed an intractable problem years ago, is advanced by Christoph Viebahn in Chapter 3 on the anterior margin of the mammalian gastrula and its role in axis formation and head induction. David A. Weisblat, Françoise Z. Huang, Deborah E. Isaksen, Nai-Jia L. Liu, and Paul Chang consider this remarkable progress in their chapter on the appreciation of non-D quadrants in leech embryos.

Plant development biologists will be particularly interested in Chapter 2, by Elena del Campillo, on multiple endo-1,4- β -D-glucanase genes in *Arabidopsis*, because it adds to the extraordinary understanding of the development of this model. Shirley J. Wright, in her paper on sperm nuclear activation during fertilization, details our knowledge on the manner in which the sperm nucleus is transformed into a decondensed active genomic partner.

Perhaps it is fitting that Volume 46, which begins with a consideration of the egg, ends with an exciting article on brain development. In Chapter 6, Flora M. Vaccarino, Michael L. Schwartz, Rossana Raballo, Julianne Rhee, and Richard Lyn-Cook consider how fibroblast growth factor signaling regulates growth and morphogenesis at multiple steps during brain development.

Together with the other volumes in this series, this volume provides a comprehensive survey of major issues at the forefront of modern molecular mechanisms of developmental biology. These chapters should be valuable to researchers in the fields of plant and animal development, as well as to students and other professionals who want an introduction to current topics in neurobiology; cellular, molecular, and genetic approaches to developmental biology; and plant biology. This volume in particular will be essential reading for anyone interested in plant de-