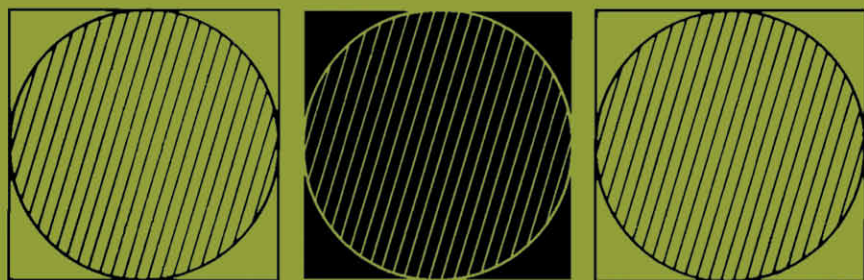


Developmental Regulation

Aspects of
Cell Differentiation



Edited by Stuart J. Coward

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DEVELOPMENTAL REGULATION

Aspects of Cell Differentiation

CELL BIOLOGY: A Series of Monographs

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Aspects of Cell Differentiation

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Preface

In a field of such wide scope as developmental biology, it is impossible to include or to do justice to each and every important facet in any one book. I have attempted to draw together in this work some studies which are directed toward the orderly changes in cell phenotypes which we understand to be developmental in nature. The exciting, fundamental advances in genetics, cell biology, and molecular biology occurring over the last decade not only have reshaped the investigator's thinking and reinforced his armamentarium, but have brought developmental studies to a critical threshold point toward the elucidation of the basic mechanisms of differentiation. These changes, I believe, are reflected in the nine chapters of this volume. The linear ordering of the chapters obviously should not be regarded as describing the principal logical interactions. This would require arrangement within a spheroid; it is for the reader to make that juxtaposition.

STUART J. COWARD

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1

RNA and Protein Synthesis during Early Animal Embryogenesis

TOM HUMPHREYS

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I. Introduction

Embryogenesis is an orderly progression of the organism from a relatively simple fertilized egg to a much more complex functional individual. The rather similar cells resulting from cleavage must differentiate into a host of different cell types organized into diverse tissues and specialized for a variety of functions. Modern analysis of cellular biochemistry and molecular biology has established a scheme of molecular function and interdependency which leads to the general assertion that the central event in this morphological diversification is the orderly synthesis of appropriate enzymatic, structural, and regulatory proteins. It is the proteins, with their extensive molecular diversity, which perform most cellular functions. RNA molecules copied from the DNA encoding the protein's amino acid sequence direct the assembly and synthesis of the protein molecules. The activities of the DNA and RNA which specify the structure of the proteins appear to be regulated by protein molecules. The other molecules of cells, such as polysaccharides and lipids, are themselves synthesized and usually organized by protein mole-