<<基因的表达与调控>>

图书基本信息

书名：<<基因的表达与调控>>

13位ISBN编号：9787040176759

10位ISBN编号：7040176750

出版时间：2006-12

出版时间：高等教育

作者：马骏

页数：582

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前言

All genes must be expressed to exhibit their biological activities. How genes are expressed and regulated is acentral question in molecular biology and our knowledge in this area has been expanding enormously in recent years.The complexity of gene regulation is compounded by the fact that gene activities reach every comer of biology.Transcription is universally the first step toward expressing a gene. It is a highly regulated process.

Understandingthe molecular mechanisms of transcription regulation is of fundamental importance. For protein-coding genes, post-transcriptional steps, including pre-mRNA processing, mRNA transport and translation, can also play importantroles in regulating gene expression. To contain the scope of this book, we will focus primarily on RNA polymeraseII transcription and regulation. We will explore not only the biochemical basis of transcription but also thebiological consequences of, and biological influences on gene transcription.

The book is composed of 35 individual review articles written by authorities in the field. The chapters areorganized into five sections： The History, The Machinery, The Regulators, The Genome, and Special Topics. TheHistory section contains one chapter, written by James Goodrich and Robert Tjian, who provide an excellenthistorical perspective and overview of the transcription process. The Machinery section has six chapters that coveressential topics on the transcriptional apparatus, general cofactors, chromatin structure, and core promoter structure.The Regulators section has thirteen chapters. While the first two of them investigate the mechanisms oftranscriptional activation and repression, the remaining eleven chapters discuss in depth selected gene-specifictranscription factors that play critical roles in a variety of biological processes, including STATs, Smads, NFvd3, nuclear receptors, NFAT, Rb, p53, HIV Tat, ATFs, c-Jun and Hox proteins. The Genome section contains six chaptersthat examine topics relevant to transcription regulation and genome behavior , including chromatin boundaries, heterochromatin, DNA methylation, genomic analysis, genomic integrity, and cell death. Finally, the Special Topicssection contains nine chapters that investigate such important issues as pre-mRNA splicing, DNA supercoiling, microRNA, transcription factor dynamics, role of actin in transcription, gene therapy, and transcription regulation inbacteria, plants and developmental signaling. When Higher Education Press invited me to write a textbook for their Current Scientific Frontiers book seriestwo years ago, I did not think I had the time needed to tackle such a big project. Instead, I made a proposal——endorsedquickly by HEP——to explore the possibility of editing a book （resembling a textbook style） on the topic of geneexpression and regulation, with individual review articles written by experts in the field. Without the enthusiasticsupport and generous commitment from the contributors, this project would have never even started. I am deeplyindebted to all of them. Every chapter in this book is a scholarly work reflecting numerous hours of intense efforts ofthe contributors. I would like to express my special thanks to Cheng-Ming Chiang for generously contributing twoexcellent chapters, a few contributors for kindly agreeing to write on relatively short notice, and Gordon Hager forproviding the cover photo and design suggestions. I would also like to thank HEP for their flexibility and trust in thisproject, and the HEP and Springer editorial and design teams, in particular Li Shen at HEP, for their excellent work.Finally, I would like to thank Bingxiang Li at HEP for the countless email communications and her hard work——atevery step along the way——that made this book a reality.

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内容概要

This book offers a comprehensive look into the science ofgene expression and regulation. Focusing on topics such asactions of nuclear receptors, RNA processing, and DNAmethylation and imprinting, Gene Expression andRegulation is edited by a leading biologist and includescontributions by experts in the field.

作者简介

Jun Ma is an Associate Professor at the Division of Developmental Biology, Cincinnati Childrens Hospital Research Foundation and University of Cincinnati College of Medicine. He graduated from Peking University in 1982, majoring in Biology. He did his graduate work with Mark Ptashne at the Department of Biochemistry and Molecular Biology in Harvard University, and was a Junior Fellow at the Harvard Society of Fellows between 1989-1992. He spent the summer of 1988 in the laboratory of Christiane N/isslein-Volhard at the Max-Planck-Institute for Developmental Biology in T/ibingen to collaborate with Wolfgang Driever. He joined the faculty of the University of Cincinnati College of Medicine in 1992 and has remained there since. Currently he also has a collaborative base at the Institute of Biophysics of the Chinese Academy of Sciences in Beijing. His earlier work on the yeast activator GAL4 helped pave the way to the development of the yeast two-hybrid system. His current research focuses on the mechanisms of transcription control and development in Drosophila.

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书籍目录

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编辑推荐

Presented in the flowing five sections， this book covers afull spectrum of topics： The History; The Machinery; TheRegulators; "the Genome; and Special Topics. TheMachinery section covers the transcriptional apparatus andgeneral transcription factors. The Regulators sectionexamines selected gene-specific transcription factorsimportant to regulating gene expression. The Genomesection Covers issues relevant to the behavior of the genomein relation to gene regulation. The Special Topics sectiondiscusses several selected topics ranging from bacterial andplant gene expression to I） NA topology and interferenceRNA. The books focus is on scientific concepts and issues， rather than specific organisms or experimental approaches.Complete with more than 100 illustrations， Gene Expressionand Regulation provides biologists with concise andcomprehensive research outlined in chapters including：DNA Topology and Transcription Gene Expression in Plants Chromatin and Chromatin Remodeling Core Promoter Elements Bacterial Gene Regulation Transcription Factor Dynamics

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