

THE REGULATORY GENOME

Gene Regulatory Networks In Development and Evolution

ERIC H. DAVIDSON

"Eric Davidson is one of the real pioneers in deciphering the mysteries of development—that process by which organisms start as a single cell and progressively develop complex body plans and tissues.... This is a milestone work that needs to be read by every biologist interested in development, evolution and a systems view of life—for it provides deep insights into each of these areas."

—**Lee Hood**, Institute for Systems Biology, Seattle, WA, U.S.A.

"Prof. Davidson achieves a remarkable synthesis of key concepts in genomics, embryology, and evolutionary biology.... The book is at the cusp of traditional disciplines in the biological sciences and the emerging field of computational biology. We finally have a book that reduces complex phenomena to basic principles, and then describes how these principles can explain among the most remarkable phenomena in nature: animal development and evolution."

—**Mike Levine**, University of California, Berkeley, U.S. A.

"Davidson's book is tightly written with an impressive coverage of the field.... Eric Davidson's latest analysis of gene regulation reflects the author's deep knowledge and understanding of the patterns of regulation and their underlying logic, and of greater interest to evolutionary biologists, how the evolution of these regulatory networks over the past several hundred million years has influenced the evolution of animal life."

—**Douglas H. Erwin**, National Museum of Natural History

"Davidson forcefully reminds us that in the scientific method causality is everything; all other approaches are just distractions.... Davidson presents to us for the first time the "biological computer" of cell regulation.... In the post genome sequence era, this is an epochal book marking a sea change to principled, quantitative biological reality. As the first biology textbook grounded in causality-focused and genomics-based systems... *The Regulatory Genome* is poised to become the definitive text for most popular biology, engineering and computational biology courses..."

—**Sorin Istrail**, Brown University, Providence, RI, U.S.A.

The Regulatory Genome beautifully explains the control of animal development in terms of structure/function relations of inherited regulatory DNA sequence, and the emergent properties of the gene regulatory networks composed of these sequences. New insights into the mechanisms of body-plan evolution are derived from considerations of the consequences of change in developmental gene regulatory networks. It is clearly written with the object of explaining regulatory causality without requiring of the reader a sophisticated background in descriptive developmental biology. This unique text supersedes anything currently available in the market.

Cover images: Transgenic sea urchin embryo expressing GFP reporter under control of skeletogenic regulatory system; skeletogenic gene regulatory network superimposed.



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