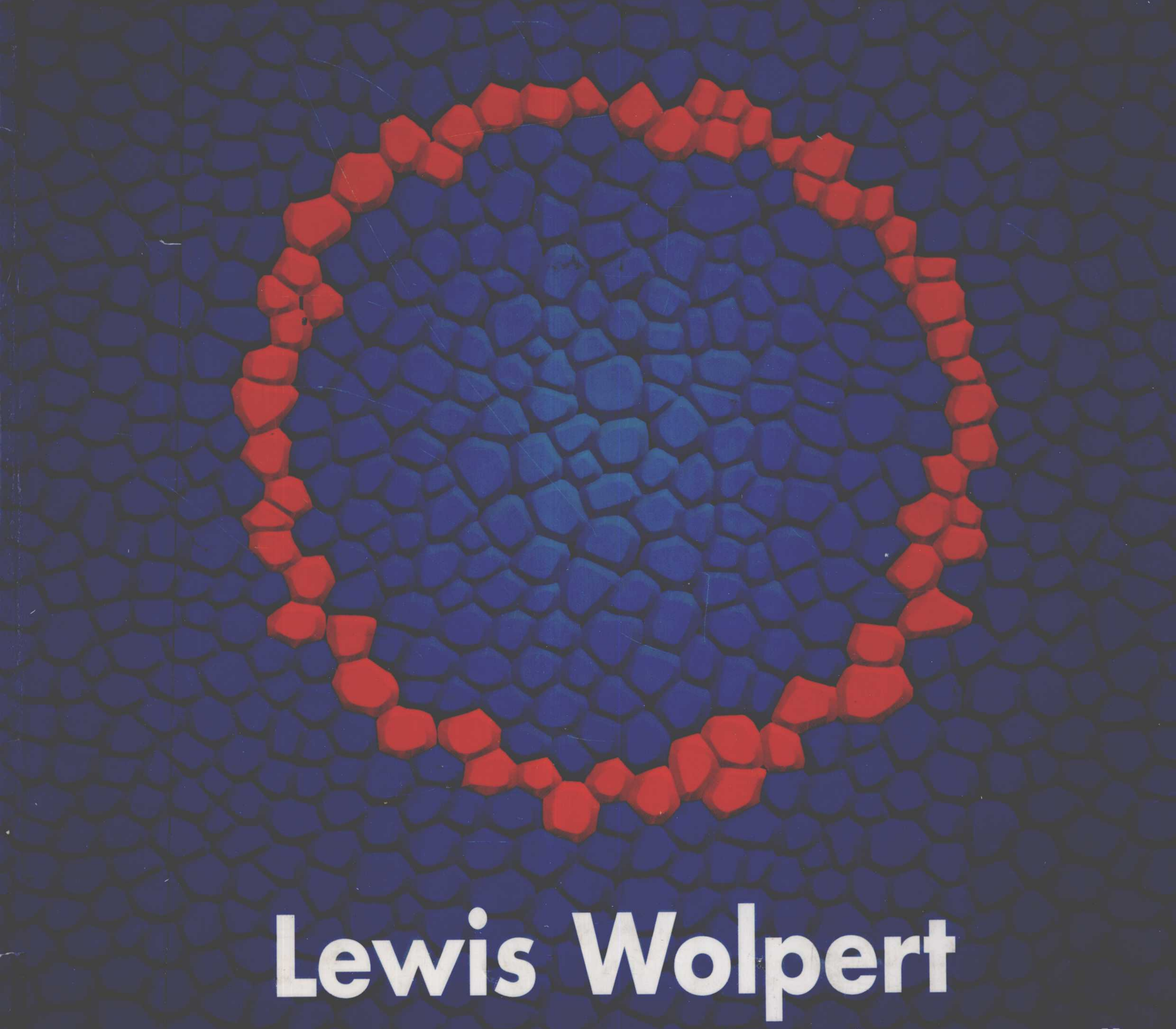
PRINCIPLES OF DEVELOPMENT



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CURRENT BIOLOGY LTD
London • New York

1998

OXFORD UNIVERSITY PRESS
Oxford • New York • Tokyo

Text editor: Eleanor Lawrence
Project editor: Giles Montier
Copy editor: Hazel Richardson
Indexer: Liza Weinkove

Illustrator: Matthew McClements
Design and layout: Huw Woodman
Production: Zoe Edwards

Published by:
Current Biology Ltd.,
Middlesex House,
34–42 Cleveland Street,
London W1P 6LB, UK.

Oxford University Press,
Great Clarendon Street,
Oxford OX2 6DP, UK.

Oxford, New York
Athens, Auckland, Bangkok, Bogota, Bombay,
Buenos Aires, Calcutta, Cape Town, Dar es Salaam,
Delhi, Florence, Hong Kong, Istanbul, Karachi,
Kuala Lumpur, Madras, Madrid, Melbourne,
Mexico City, Nairobi, Paris, Singapore, Taipei,
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companies in Berlin, Ibadan.

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Published in the United States
by Oxford University Press, Inc. New York.
198 Madison Avenue,
New York NY 10016, USA.

The cover represents cells communicating positional information and cell identity by production of a diffusion gradient in a signaling molecule. At a threshold concentration, cells are triggered to differentiate, thus expressing a new phenotype. Design by Matthew McClements.

A catalog record for this book is available from the British Library.

Library of Congress Cataloging in Publication Data
(data available)

ISBN 0-19-850263-X.

This book was produced using Corel VENTURA Publisher, CorelDRAW, Adobe Photoshop, and Strata Vision3d. Editorial assistance was provided by Mary Devane, Clare Rathbone, and Daniel Kirschner.

Printed in Singapore by Stamford Press.

Preface

Developmental biology is at the core of all biology. It deals with the process by which the genes in the fertilized egg control cell behavior in the embryo and so determine its pattern, its form, and much of its behavior. The progress in developmental biology in recent years with the applications of advances in cell and molecular biology, has been remarkable and an enormous amount of information is now available.

Principles of Development is designed for undergraduates as well as graduates, and the emphasis is on principles and key concepts. Central to our approach is that development can be best understood by understanding how genes control cell behavior. We have assumed that the students have some very basic familiarity with cell biology and genetics, but all key concepts, like the control of gene activity, are explained in the text.

Conscious of the pressures on students, we have tried to make the principles as clear as possible and to provide numerous summaries, both in words and in pictures. The illustrations in the book are a special feature and have been carefully designed and chosen to illuminate both experiments and mechanisms.

We have resisted the temptation to cover every aspect of development and have, instead, focused on those systems that best illuminate common principles. Indeed a theme that runs throughout the book is that universal principles govern the process of development. At all stages, what we included has been guided by what we believe undergraduates should know about development.

We have thus concentrated our attention on vertebrates and *Drosophila*, but not to the exclusion of the other systems, such as nematodes and sea urchins, where they best illustrate a concept. An important feature of our book is the inclusion of the development of plants, which is usually neglected in text books. There have been striking advances in plant developmental biology in recent times, and some unique and important features have emerged. As knowing the basic features of the embryology of the main organisms used to study development is essential for an understanding of molecular mechanisms, we have introduced embryology at an early stage.

Whereas our emphasis has been on the laying down of the body plans and organ systems, such as limbs and the nervous system, we have also included later aspects of development, including growth and regeneration. The book concludes with a consideration of evolution and development.

In providing references, our prime concern has been to guide the students to helpful papers rather than giving credit to the scientists who have made major contributions: to those whom we have neglected, we apologize.

The way the book was written was rather special. Although I was in continual consultation with my co-authors, I did all the writing—and I mean writing, which was skillfully typed by Maureen Moloney. Each chapter was also reviewed by a number of experts (see page xv), to whom we give thanks. The text was initially edited, and often re-written, by Eleanor Lawrence, whose expertise and influence pervades the book. Further critical editing was carried out by Hazel Richardson. And Huw Woodman magically turned the whole text into finished pages.

Central to the book are the illustrations, which were brilliantly created or adapted by Matthew McClements. The whole complex project was masterfully managed by Giles Montier. Particularly to Giles and Matthew, I offer my thanks for their patient dealing with my impatience and incompetence. The complete team was a pleasure, even fun, to work with.

Finally my thanks to Peter Newmark, the head of Current Biology Ltd., and to Vitek Tracz, the head of the Current Science Group; without them, the book would never have been started, let alone completed.

Lewis Wolpert

Text acknowledgments

Many thanks to the following who kindly reviewed various parts of the book.

Chapter 1

Vernon French: University of Edinburgh.
Sir John Gurdon: Wellcome CRC Institute, Cambridge.
Andrew Murray: University of California, San Francisco.
Daniel St Johnston: Wellcome CRC Institute, Cambridge.

Chapter 2

Susan Darling: University College London.
Brigid Hogan: Vanderbilt University School of Medicine.
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Andrew Murray: University of California, San Francisco.
Jonathan Slack: University of Bath.
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Daniel St. Johnston: Wellcome CRC Institute, Cambridge.

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Richard Harland: University of California, Berkeley.
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Nigel Holder: King's College London.
Janet Rossant: Samuel Lunenfield Research Institute, Toronto.
James Smith: National Institute for Medical Research, London.

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Richard Harland: University of California, Berkeley.
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Nigel Holder: King's College London.
Janet Rossant: Samuel Lunenfield Research Institute, Toronto.

Chapter 5

Kathryn Anderson: University of California, Berkeley.
Peter Bryant: University of California, Irvine.
Stephen Cohen: European Molecular Biology Laboratory, Heidelburg.
Herbert Jackle: Max-Planck Institute für Biophysikalische Chemie, Gottingen.
Daniel St Johnston: Wellcome CRC Institute, Cambridge.

Chapter 6

Jeff Hardin: University of Wisconsin, Madison.
James Priess: Fred Hutchinson Cancer Center, Seattle.
Paul Sternberg: California Institute of Technology, Pasadena.
Jeff Williams: University College London.

Chapter 7

David Meinke: Oklahoma State University.
Scott Poethig: University of Pennsylvania.
Ian Sussex: University of California, Berkeley.

Chapter 8

Marianne Bronner-Fraser: University of California, Irvine.
Charles Ettensohn: Carnegie Mellon University, Pittsburgh.
Raymond Keller: University of California, Berkeley.
Malcolm Steinberg: Princeton University.

Chapter 9

Margaret Buckingham: Institut Pasteur, France.
David Latchman: University College London Medical School.
Nicole Le Douarin: Institut d'Embryologie Cellulaire et Moléculaire du CNRS et du Collège de France, Nogent-sur-Marne.
Roger Patient: The Randall Institute, King's College London.
Fiona Watt: Imperial Cancer Research Fund, London.

Chapter 10

Stephen Cohen: European Molecular Biology Laboratory, Heidelburg.
Uma Thesleff: Institute of Biotechnology, University of Helsinki.
Cheryl Tickle: University College London.
Andrew Tomlinson: College of Physicians and Surgeons of Columbia University, New York.

Chapter 11

Michael Bate: University of Cambridge.
Steven Easter: University of Michigan.
Andrew Lumsden: United Medical and Dental School, Guy's Hospital, London.
Jack Price: SmithKline Beecham, Harlow, Essex.

Chapter 12

Denise Barlow: The Netherlands Cancer Institute, Amsterdam.
Tom Cline: University of California, Berkeley.
Jonathan Hodgkin: MRC Laboratory of Molecular Biology, Cambridge.
Anne McLaren: Wellcome CRC Institute, Cambridge.
Michael Whitaker: Newcastle University.

Chapter 13

Hans Bode: University of California, Irvine.
Susan Bryant: University of California, Irvine.
Vernon French: University of Edinburgh.
David Stocum: Indiana University-Purdue University, Indianapolis.

Chapter 14

Michael Ashburner: University of Cambridge.
Charles Brook: University College London.
Peter Bryant: University of California, Irvine.
Tom Kirkwood: University of Manchester.
Stuart Reynolds: University of Bath.
Jonathan Slack: University of Bath.
J. R. Tata: National Institute for Medical Research, London.

Chapter 15

Michael Akam: Wellcome CRC Institute, Cambridge.
Michael Coates: University College London.
John Gerhart: University of California, Berkeley.
Jonathan Slack: University of Bath.
Cliff Tabin: Harvard Medical School, Boston.

General

Brigid Hogan: Vanderbilt University, School of Medicine,
David Kimelman: University of Washington, Seattle.
Charles Rutherford: Virginia Polytechnic Institute and State University, Blacksburg.
Nancy Wall: Lawrence University,

Figure acknowledgments

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