Biological Physics of the Developing Embryo

During development, cells and tissues undergo dynamic changes in pattern and form that employ a wider range of physical mechanisms than at any other time during an organism's life. *Biological Physics of the Developing Embryo* presents a framework within which physics can be used to analyze these biological phenomena.

Written to be accessible to both biologists and physicists, major stages and components of biological development are introduced and then analyzed from the viewpoint of physics. The presentation of physical models requires no mathematics beyond basic calculus. Physical concepts introduced include diffusion, viscosity and elasticity, adhesion, dynamical systems, electrical potential, percolation, fractals, reaction–diffusion systems, and cellular automata.

With full-color figures throughout, this comprehensive textbook teaches biophysics by application to developmental biology and is suitable for graduate and upper-undergraduate courses in physics and biology.

Gabor Forgacs is George H. Vineyard Professor of Biological Physics at the University of Missouri, Columbia. He received his Ph.D. in condensed matter physics from the Roland Eötvös University in Budapest. He made contributions to the physics of phase transitions, surface and interfacial phenomena and to statistical mechanics before moving to biological physics, where he has studied the biomechanical properties of living materials and has modeled early developmental phenomena. His recent research on constructing models of living structures of prescribed geometry using automated printing technology has been the topic of numerous articles in the international press.

Professor Forgacs has held positions at the Central Research Institute for Physics, Budapest, at the French Atomic Energy Agency, Saclay, and at Clarkson University, Potsdam. He has been a Fulbright Fellow at the Institute of Biophysics of the Budapest Medical University and has organized several meetings on the frontiers between physics and biology at the Les Houches Center for Physics. He has also served as advisor to several federal agencies of the USA on the promotion of interdisciplinary research, in particular at the interface of physics and biology. He is a member of a number of professional associations, such as The Biophysical Society, The American Society for Cell Biology, and The American Physical Society.

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UNIVERSITY PRESS

Shaftesbury Road, Cambridge CB2 8EA, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi – 110025, India

103 Penang Road, #05–06/07, Visioncrest Commercial, Singapore 238467

Cambridge University Press is part of Cambridge University Press & Assessment, a department of the University of Cambridge.

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www.cambridge.org
Information on this title: www.cambridge.org/9780521783378

First published 2005

A catalogue record for this publication is available from the British Library

ISBN 978-0-521-78337-8 Hardback

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Acknowledgments

The writing of this text, addressed simultaneously to biologists and physicists, presented us with many challenges. Without the help of colleagues in both fields the book would still be on the drawing board. Of the many who advised us, made constructive remarks, and provided suggestions on the presentation of complex issues, we wish to thank particularly Mark Alber, Daniel Ben-Avraham, Andras Czirók, Scott Gilbert, James Glazier, Tilmann Glimm, Michel Grandbois, George Hentschel, Kunihiko Kaneko, Ioan Kosztin, Roeland Merks, Gerd Müller, Vidyanand Nanjundiah, Adrian Neagu, Olivier Pourquié, Diego Rasskin-Gutman and Isaac Salazar-Ciudad. Commentary from students was indispensable; in this regard we received invaluable help from Richard Jamison, an undergraduate at Clemson University, and Yvonne Solbrekken, an undergraduate at the University of Missouri, Columbia, who read most of the chapters.

We thank the members of our laboratories for their patience with us during the last five years. Their capabilities and independence have made it possible for us to pursue our research programs while writing this book. Gabor Forgacs was on the faculty of Clarkson University, Potsdam, NY, when this project was initiated, and some of the writing was done while he was a visiting scholar at the Institute for Advanced Study of the Collegium Budapest. Stuart Newman benefited from study visits to the Indian Institute of Science, Bangalore, the Konrad Lorenz Institute, Vienna, and the University of Tokyo-Komaba, in the course of this work.

In a cross-disciplinary text such as this one, graphic materials are an essential element. Sue Seif, an experienced medical illustrator, was, like us, new to the world of textbook writing. Our interactions with her in the design of the figures in many instances deepened our understanding of the material presented here. Any reader who accompanies us across this difficult terrain will appreciate the freshness and clarity of Sue's visual imagination.

Harry Frisch introduced the authors to one another more than a quarter century ago and thought that we had things to teach each other. Malcolm Steinberg, a valued colleague of both of us, showed the way to an integration of biological and physical ideas. Judith Plesset, our program officer at the National Science Foundation, was instrumental in fostering our scientific collaboration during much of the intervening period, when many of the ideas in this book were gestated. We are grateful to each of them and for the support of our families.