



# Physical Biology of the Cell

By Rob Phillips, Jane Kondev, Julie Theriot, Hernan Garcia

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*Physical Biology of the Cell* is a textbook for a first course in physical biology or biophysics for undergraduate or graduate students. It maps the huge and complex landscape of cell and molecular biology from the distinct perspective of physical biology. As a key organizing principle, the proximity of topics is based on the physical concepts that unite a given set of biological phenomena. Herein lies the central premise: that the appropriate application of a few fundamental physical models can serve as the foundation of whole bodies of quantitative biological intuition, useful across a wide range of biological problems. The Second Edition features full-color illustrations throughout, two new chapters, a significantly expanded set of end-of-chapter problems, and is available in a variety of e-book formats.

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### Review

“The book is well illustrated, problems and references complete each chapter, figures and other data can be downloaded from the Garland Science Web site. Its public is assumed to be students taking a first course in physical biology or biophysics, and scientists interested in physical modelling in biology. *Physical Biology of the Cell* has much to offer to both categories...”

- *Crystallography Reviews*

“This textbook is an excellent resource, both for a research scientist and for a teacher. The authors do a superb job of selecting the material for each chapter and explaining the material with equations and narrative in an easily digestible manner.”? *Yale Journal of Biology and Medicine (YJBM)*

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“*Physical Biology of the Cell*...aims to be both an introduction to molecular and cellular biology for physicists and an introduction to physics for biologists. Though that sounds like a daunting task, the book fully and impressively delivers. *Physical Biology of the Cell* might well become a similar classic [as *Molecular Biology of the Cell*] for anyone who heeds its mantra “quantitative data demand quantitative models.” It will give both physicists and biologists a useful introduction into the other camp’s methods and ways of thinking.”

?Ralf Bundschuh, *Physics Today*, 2009

“[The] authors of *Physical Biology of the Cell* have produced one of the first multi-purpose textbooks that is readily accessible to both physicists and biologists....When read from cover to cover, the book is both very instructive and highly entertaining, with the authors using humor to deliver strong take-home messages in each chapter....*Physical Biology of the Cell* provides instructors with excellent material to create a graduate level course in biology or physics.”

?Patricia Bassereau and Pierre Nasoy, *Nature Cell Biology*, 2009

“*Physical Biology of the Cell* is beautifully crafted: self-contained and modular, it provides tutorials on fundamentals and has material to hold the interest of a more sophisticated reader. It is fast-paced, proceeding within each chapter from freshman basics to graduate level sophistication. To truly master the physics presented in the

book, one should do the problems provided with each chapter. These problems are well thought out and are a major teaching resource.”

?Boris Shraiman, *Cell*, 2009

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?Gabor Forgacs, *Quarterly Review of Biology*, 2009

“I would thoroughly recommend [*Physical Biology of the Cell*] to anyone interested in investigating or applying biophysical research methods to their work. It is likely to be a fantastic teaching tool and is a welcome addition in this age of increasingly interdisciplinary science.”

?David Stephens, *The British Society for Cell Biology Newsletter*, 2009

## About the Author

**Rob Phillips** is the Fred and Nancy Morris Professor of Biophysics and Biology at the California Institute of Technology. He received a PhD in Physics from Washington University in St. Louis.

**Jane Kondev** is a Professor of Physics in the Graduate Program in Quantitative Biology at Brandeis University. He received his Physics BS degree from the University of Belgrade, and his PhD from Cornell University.

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**Hernan G. Garcia** is an Associate Research Fellow at Princeton University. He received a BS in Physics from the University of Buenos Aires and a PhD in Physics from the California Institute of Technology.

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