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Review of *Molecular Infection Biology: Interactions Between Mircoorganisms and Cells* by Jörg Hacker and Jürgen Heesemann

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over 100 in total, although described specifically for each system, are generalizable. The text contains additional tips and useful suggestions for improving the protocols. Some limitations to the book exist—integrins are not well represented, nor are systems involving the mammalian central nervous system. In addition, protocols do not contain information on safe handling of chemicals, or identify chemicals that may be a safety concern particularly to more junior investigators. But, the majority of scientists interested in cell-cell interactions will find this volume a useful addition to their library.

CYNTHIA F BEARER, *Pediatrics, Case Western Reserve University, Cleveland, Ohio*

ANNUAL REVIEW OF CELL AND DEVELOPMENTAL BIOLOGY. *Volume 18: 2002.*

Edited by Randy Schekman, Larry Goldstein, Steven L McKnight, and Janet Rossant. Palo Alto (California): Annual Reviews. \$72.00. xii + 842 p + 46 pl; ill.; subject index and cumulative indexes (contributing authors and chapter titles, Volumes 14–18). ISBN: 0–8243–3118–4. 2002.

COMPUTATIONAL CELL BIOLOGY. *Interdisciplinary Applied Mathematics, Volume 20.*

Edited by Christopher P Fall, John M Wagner, Eric S Marland, and John J Tyson. New York: Springer. \$59.95. xx + 468 p; ill.; index. ISBN: 0–387–95369–8. 2002.

Before his untimely death in 1999, Joel Keizer had begun writing what he intended to be an introduction to modeling in cell biology, with particular emphasis on the computational aspects. Keizer was one of the foremost cellular modelers in the world, upon whose shoulders the rest of us are proud to stand. Tragically, he was never able to complete his book. Fortunately, Fall et al. have adapted Keizer's notes and edited this introduction to computational cell biology.

The book begins with a discussion of ionic models (such as the Morris-Lecar model and the Hodgkin-Huxley model) and then describes models of active and passive transport. After a discussion of how and why one should separate time scales in a model, they move on to whole-cell models, including both closed-cell and open-cell models, and then models of intercellular and synaptic communication are presented. The second half of the book has a markedly different flavor, as the introduction of spatial and stochastic models requires a significantly higher level of mathematical expertise. An introduction to spatial modeling and the diffusion equation is followed by chapters

on calcium waves, biochemical oscillations, the cell cycle, stochastic gating of ion channels, and molecular motors. Throughout the book the theoretical discussions are accompanied by extensive use of computations.

Although the wide range of mathematical sophistication does not make it a comfortable book for all readers, some of the advanced topics are absolute gems. The stochastic ion channel chapter, as well as the discussion of cell cycle control, stood out as a masterpiece. It seems a little unfair to single out only two chapters for particular praise, but such is the unfair nature of reviews.

Computational Cell Biology is an excellent addition to the literature, filling a number of gaps, and presenting the material in a way that will be useful for students. In short, it does Keizer proud.

JAMES SNEYD, *Mathematics, University of Auckland, Auckland, New Zealand*

MOLECULAR INFECTION BIOLOGY: INTERACTIONS BETWEEN MICROORGANISMS AND CELLS.

*By Jörg Hacker and Jürgen Heesemann; translated by Renate FitzRoy. Hoboken (New Jersey): Wiley-Liss; Heidelberg (Germany): Spektrum Akademischer Verlag. \$79.95. xvii + 339 p; ill.; index. ISBN: 0–471–17846–2. [Originally published as *Molekulare Infektionsbiologie* in 2000.] 2002.*

Pathogenesis is one potential outcome of the constant struggle between host defenses and the desire of microorganisms to acquire a privileged niche. This mutually competitive evolutionary process has resulted in interactions among complex and often elegant systems throughout the course of infections. The complexity of these interactions and the large number of infectious agents that exist makes the introduction of students to infectious diseases, as well as a comprehensive review of the field, an extremely daunting task. This book provides just such a comprehensive and timely description of the field in a manner that is easily understandable and enjoyable to read. There is possibly only one other book that attempts to cover similar topics, making this volume an important addition to the critical reading lists for students and postdoctoral researchers, as well as providing a useful reference for established investigators.

The different sections of this book are presented in a clear progression from more general background on classes of pathogens and aspects of the host defenses that leads nicely into discussion of the balance between symbiosis and disease as well as mechanisms of pathogenesis. There is also a valuable discussion of cellular microbiology, which makes it clear how this new field is dramatically improving our understanding of pathogen-host

cell interactions. Important information is included on prevention and treatment methods and the experimental approaches that are used to study pathogenesis, along with specific descriptions of several of these methods. One of the later chapters goes into more detail on several model pathogens as examples of what has been discovered when these methods have been applied. The appendix contains a number of useful tables that allow direct comparison of many pathogenic characteristics from their various categories to antibiotic resistance mechanisms. This book is an important addition to the infectious disease literature. It would serve as an excellent textbook for molecular pathogenesis courses at both the advanced undergraduate and graduate level, as well as important reading for existing graduate students and postdoctoral researchers in the field. Established investigators will find that it serves as an extremely useful reference and very readable introduction to pathogenesis, providing a comprehensive and up-to-date perspective on the field.

JEFFREY D CIRILLO, *Veterinary & Biomedical Sciences, University of Nebraska, Lincoln, Nebraska*



GENETICS & EVOLUTION

GENOMIC IMPRINTING AND KINSHIP. *The Rutgers Series in Human Evolution.*

By David Haig. *New Brunswick (New Jersey): Rutgers University Press.* \$65.00 (hardcover); \$29.00 (paper). xiii + 218 p; ill.; index. ISBN: 0-8135-3026-1 (hc); 0-8135-3027-X (pb). 2002.

This collection of 13 papers, published by the author over the last decade or so, charts the history of the parental conflict theory as it relates to the evolution of genomic imprinting. The papers are organized chronologically, but are grouped into roughly cohesive sections. Appropriately, the book begins with Haig's work on parent specific gene expression in plant endosperm, the genesis for the kinship theory of imprinting. The third section contains the classic discussion of the role of imprinted genes in nutrient transfer within the developing embryo and the conflict of interest between paternal and maternal genomes. The rest of the papers, although less influential, are equally as important and attempt to shift the focus of attention away from growth. As Haig explains, both mathematically and in plain English, the kinship theory of imprinting can apply to any gene when the expression of that gene has consequences for

asymmetric kin, and this may be at any number of levels. For example, the last paper in this collection discusses imprinting in organisms that form kin-based social groups and its subsequent effect on social behavior. This is particularly relevant, as more and more imprinted genes are shown to have roles in cognition and behavior—see Isles and Wilkinson (2000). *Trends in Cognitive Sciences* 4(8):309–318).

Like all evolutionary biologists worth their salt, Haig has a healthy respect for W D Hamilton, and the format of this book is similar to Hamilton's *The Narrow Roads of Gene Land: The Collected Papers of W. D. Hamilton* (1996–2001. New York: W. H. Freeman), in that each section is introduced with a brief autobiographical snippet. The papers make for good reading, and the nervous excitement of the early days when Haig first stumbles upon genomic imprinting in a *Nature* News and Views section is almost palpable. The introductions to each section are also written in an honest way, with critics tackled head-on, and colleagues and collaborators openly acknowledged. Overall, this is an excellent book for the cognoscente, as it groups together the best of Haig's work in this field. It is our hope, however, that it may be more widely read than by just those involved with genomic imprinting, as there are gems of information and ideas contained within that would be of general interest to both evolutionary geneticists and behavioral ecologists.

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LIFE HISTORY EVOLUTION.

By Derek Roff. *Sunderland (Massachusetts): Sinauer Associates.* \$52.95 (paper). vii + 527 p; ill.; index. ISBN: 0-87893-756-0. 2002.

This book is concerned with how evolution and, in particular, the process of natural selection has shaped the life-history strategies of organisms. The volume is strong on the genetic basis of selection, although it is probably not the place for a newcomer to learn the details of this material. The approach to specific topics also emphasizes the relevant genetics, but is comfortable with phenotypic arguments, provided they can be justified in genetic terms. Other admirable aspects of the book include the many examples pitting theory against data, discussion of the limits of experiments, and the application of statistics to data.

The life-history theory presented in this volume is typically age based; analyzing in-depth traditional topics such as age at maturity and clutch size decisions. There is also a substantial chapter on evolution in stochastic environments; although generally excellent, it contains examples that I would