Methods in ENZYMOLOGY

Volume 454

Computer Methods, Part A

Edited by

Michael L. Johnson

Ludwig Brand

VOLUME FOUR HUNDRED AND FIFTY-FOUR

METHODS IN ENZYMOLOGY

Computer Methods, Part A

EDITED BY

MICHAEL L. JOHNSON
Departments of Pharmacology and Internal Medicine
University of Virginia Health System
Charlottesville, Virginia

LUDWIG BRAND
Department of Biology
Johns Hopkins University
Baltimore, MD, USA

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32 Jamestown Road, London NW17BY, UK

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ISBN-13: 978-0-12-374552-1

PRINTED IN THE UNITED STATES OF AMERICA
09 10 11 12 9 8 7 6 5 4 3 2 1

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Pasadena, California

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Thomas J. Balkin
Department of Behavioral Biology, Walter Reed Army Institute of Research, Division of Neuroscience, Silver Spring, Maryland

Daniel A. Beard
Biotechnology and Bioengineering Center and Department of Physiology, Medical College of Wisconsin, Milwaukee, Wisconsin

Gregory Belenky
Sleep and Performance Research Center, Washington State University, Spokane, Washington

Patrick L. Benitez
Departments of Pharmacology and Medicine, University of Virginia Health System, Charlottesville, VA

Marc Breton
University of Virginia Health System, Charlottesville, Virginia

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Department of Biochemistry, The University of Texas Health Science Center at San Antonio, San Antonio, Texas

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University of Virginia Health System, Charlottesville, Virginia

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Department of Biochemistry, The University of Texas Health Science Center at San Antonio, San Antonio, Texas

Harold B. Dowse
School of Biology and Ecology and Department of Mathematics and Statistics, University of Maine, Orono, Maine

William S. Evans
Endocrinology and Metabolism Department of Medicine, and Department of Obstetrics and Gynecology, University of Virginia Health System, Charlottesville, Virginia

Leon S. Farhy
Endocrinology and Metabolism Department of Medicine, University of Virginia Health System, Charlottesville, Virginia

David M. Freiberger
Sleep and Performance Research Center, Washington State University, Spokane, Washington

Alan Genz
Department of Mathematics, Washington State University, Pullman, Washington

A. Granada
Institute for Theoretical Biology, Humboldt-Universität zu Berlin, Berlin, Germany

Alexander Greene
School of Medicine, University of Florida, Gainesville, Florida

R. M. Hennig
Behavioral Physiology, Biology Department, Humboldt-Universität zu Berlin, Berlin, Germany

H. Herzel
Institute for Theoretical Biology, Humboldt-Universität zu Berlin, Berlin, Germany

Michael L. Johnson
Departments of Pharmacology and Medicine, University of Virginia Health System, Charlottesville, VA

Boris Kovatchev
University of Virginia Health System, Charlottesville, Virginia

A. Kramer
Laboratory of Chronobiology, Charité Universitätsmedizin Berlin, Berlin, Germany

Gary H. Kamimori
Department of Behavioral Biology, Walter Reed Army Institute of Research, Division of Neuroscience, Silver Spring, Maryland

Martin J. Kushmerick
Departments of Radiology, Bioengineering, Physiology and Biophysics, University of Washington, Seattle, Washington

George I. Makhatadze
Department of Biology and Center for Biotechnology and Interdisciplinary Studies, Rensselaer Polytechnic Institute, Troy, New York

Jay I. Myung
Department of Psychology, Ohio State University, Columbus, Ohio

Luitgard Nagel-Steger
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Ralf Nass
Endocrinology and Metabolism Department of Medicine, University of Virginia Health System, Charlottesville, Virginia

Jens Erik Nielsen
School of Biomolecular and Biomedical Science, Centre Synthesis and Chemical Biology, UCD Conway Institute, University College Dublin, Belfield, Dublin, Ireland

Robert Palais
Department of Pathology, University of Utah, Salt Lake City, Utah, and Department of Mathematics, University of Utah, Salt Lake City, Utah

Lenore Pipes
Departments of Pharmacology and Medicine, University of Virginia Health System, Charlottesville, VA

Mark A. Pitt
Department of Psychology, Ohio State University, Columbus, Ohio

Raina Robeva
Department of Mathematical Sciences, Sweet Briar College, Sweet Briar, Virginia

B. Ronacher
Behavioral Physiology, Biology Department, Humboldt-Universität zu Berlin, Berlin, Germany

David C. Samuels
Center for Human Genetics Research, Department of Molecular Physiology and Biophysics, Nashville, TN

Katrina L. Schweiker
Department of Biochemistry and Molecular Biology, Penn State University College of Medicine, Hershey, Pennsylvania, and Department of Biology and Center for Biotechnology and Interdisciplinary Studies, Rensselaer Polytechnic Institute, Troy, New York

Amber D. Smith
Sleep and Performance Research Center, Washington State University, Spokane, Washington

Yun Tang
Department of Psychology, Ohio State University, Columbus, Ohio

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Department of Chemistry, Vanderbilt University, Nashville, Tennessee

Michael O. Thorner
Endocrinology and Metabolism Department of Medicine, University of Virginia Health System, Charlottesville, Virginia

Hans P. A. Van Dongen
Sleep and Performance Research Center, Washington State University, Spokane, Washington

Paula P. Veldhuis
Departments of Pharmacology and Medicine, University of Virginia Health System, Charlottesville, VA

Kalyan C. Vinnakota
Biotechnology and Bioengineering Center and Department of Physiology, Medical College of Wisconsin, Milwaukee, Wisconsin

Carl T. Wittwer
Department of Pathology, University of Utah, Salt Lake City, Utah

Fan Wu
Biotechnology and Bioengineering Center and Department of Physiology, Medical College of Wisconsin, Milwaukee, Wisconsin

PREFACE

The use of computers and computational methods has become ubiquitous in biological and biomedical research. This has been driven by numerous factors, a few of which follow: One primary reason is the emphasis being placed on computers and computational methods within the National Institutes of Health (NIH) roadmap; another factor is the increased level of mathematical and computational sophistication among researchers, particularly among junior scientists, students, journal reviewers, and NIH study section members; and another is the rapid advances in computer hardware and software, which make these methods far more accessible to the rank-and-file research community.

A general perception exists that the only applications of computers and computer methods in biological and biomedical research are either basic statistical analysis or the searching of DNA sequence data bases. While these are important applications, they only scratch the surface of the current and potential applications of computers and computer methods in biomedical research. The various chapters within this volume include a wide variety of applications that extend this limited perception.

The training of the majority of senior M.D.'s and Ph.D.'s in clinical or basic disciplines at academic medical centers rarely includes advanced coursework in mathematics, numerical analysis, statistics, or computer science. Generally, their hardware and software are maintained by a hospital staff that installs all hardware and software and even restricts what is available on their computers. Therefore, a critical aspect of this volume is information and methodology transfer to this target audience. This specific audience is indifferent as to whether the hardware and software are modern, object-oriented, portable, reusable, use the latest markup language, interchangeable, or easily maintained. These users are only interested in analyzing their data. The chapters within this volume have been written in order to be accessible to this target audience.

Michael L. Johnson and Ludwig Brand

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