

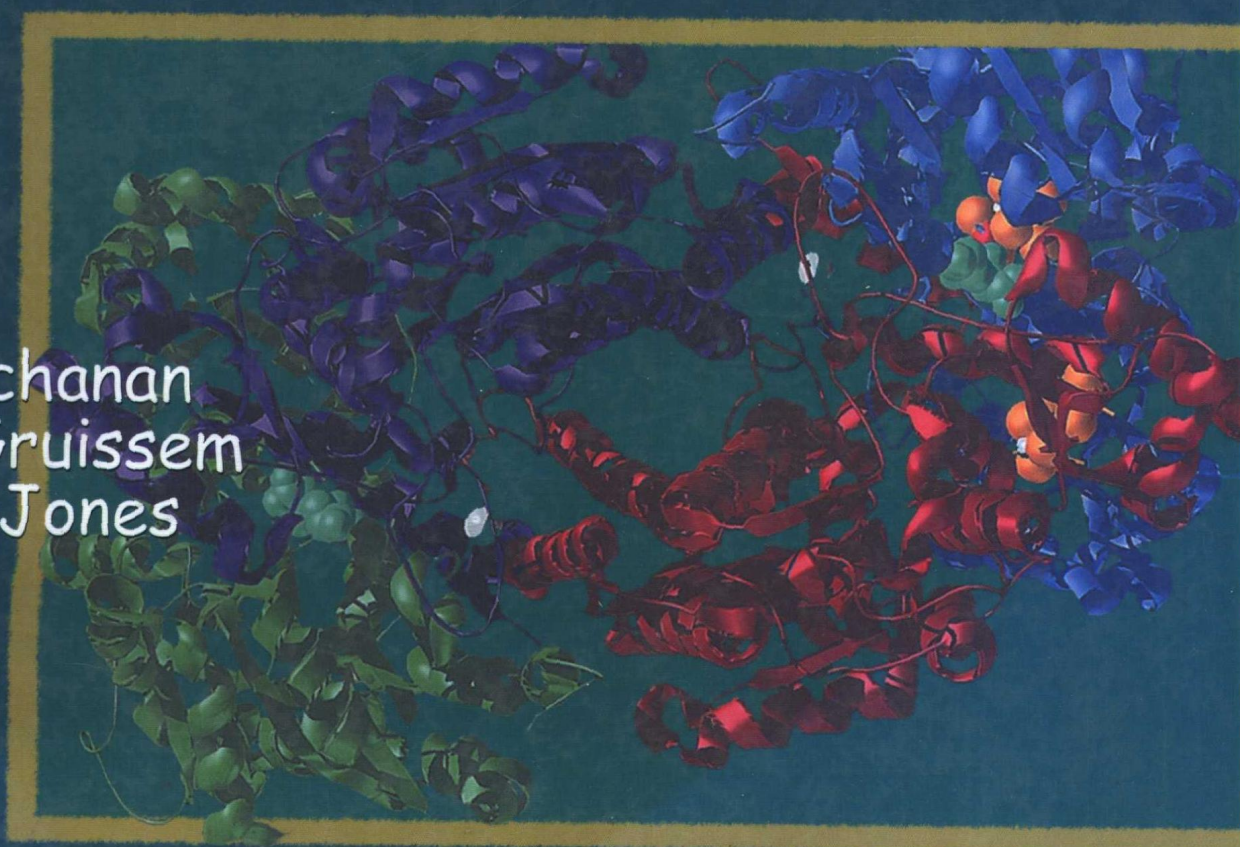


中国科学院研究生教学丛书

植物生物化学与分子生物学

Biochemistry & Molecular Biology of Plants

Bob B. Buchanan
Wilhelm Gruissem
Russell L. Jones



科学出版社



American Society of Plant Physiologists

影印版

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内 容 简 介

本书是一本经典巨著,由数十位该领域的国际权威专家共同编写。内容丰富,图文并茂,涵盖了植物分子生物学、生物化学、细胞生物学,以及植物生理学等知识。本书全部彩图以光盘形式附于书后,真实自然,具有很高的参考价值。

本书可供生命科学及相关领域的研究生、科研人员参考使用。

Bob B. Buchanan, Wilhelm Gruissem, Russell L. Jones

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《中国科学院研究生教学丛书》序

在21世纪曙光初露,中国科技、教育面临重大改革和蓬勃发展之际,《中国科学院研究生教学丛书》——这套凝聚了中国科学院新老科学家、研究生导师们多年心血的研究生教材面世了。相信这套丛书的出版,会在一定程度上缓解研究生教材不足的困难,对提高研究生教育质量起着积极的推动作用。

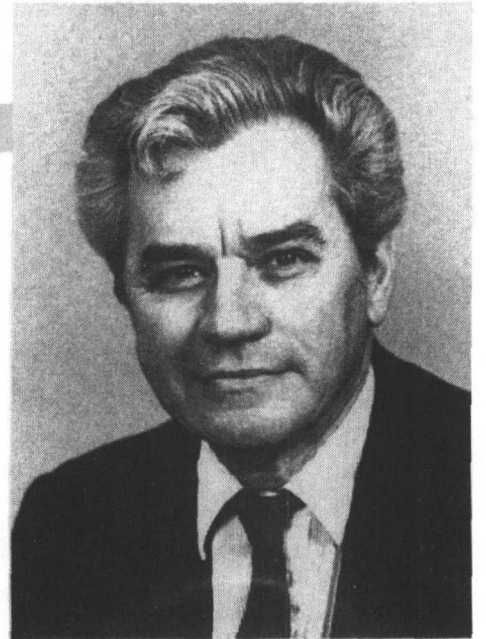
21世纪将是科学技术日新月异,迅猛发展的新世纪,科学技术将成为经济发展的最重要的资源和不竭的动力,成为经济和社会发展的首要推动力量。世界各国之间综合国力的竞争,实质上是科技实力的竞争。而一个国家科技实力的决定因素是它所拥有的科技人才的数量和质量。我国要想在21世纪顺利地实施“科教兴国”和“可持续发展”战略,实现邓小平同志规划的第三步战略目标——把我国建设成中等发达国家,关键在于培养造就一支数量宏大、素质优良、结构合理、有能力参与国际竞争与合作的科技大军。这是摆在我国高等教育面前的一项十分繁重而光荣的战略任务。

中国科学院作为我国自然科学与高新技术的综合研究与发展中心,在建院之初就明确了出成果出人才并举的办院宗旨,长期坚持走科研与教育相结合的道路,发挥了高级科技专家多、科研条件好、科研水平高的优势,结合科研工作,积极培养研究生;在出成果的同时,为国家培养了数以万计的研究生。当前,中国科学院正在按照江泽民同志关于中国科学院要努力建设好“三个基地”的指示,在建设具有国际先进水平的科学研究基地和促进高新技术产业发展基地的同时,加强研究生教育,努力建设好高级人才培养基地,在肩负起发展我国科学技术及促进高新技术产业发展重任的同时,为国家源源不断地培养输送大批高级科技人才。

质量是研究生教育的生命,全面提高研究生培养质量是当前我国研究生教育的首要任务。研究生教材建设是提高研究生培养质量的一项重要的基础性工作。由于各种原因,目前我国研究生教材的建设滞后于研究生教育的发展。为了改变这种情况,中国科学院组织了一批在科学前沿工作,同时又具有相当教学经验的科学家撰写研究生教材,并以专项资金资助优秀的研究生教材的出版。希望通过数年努力,出版一套面向21世纪科技发展、体现中国科学院特色的高水平的研究生教学丛书。本丛书内容力求具有科学性、系统性和基础性,同时也兼顾前沿性,使阅读者不仅能获得相关学科的比较系统的科学基础知识,也能被引导进入当代科学研究的前沿。这套研究生教学丛书,不仅适合于在校研究生学习使用,也可以作为高校教师和专业研究人员工作和学习的参考书。

“桃李不言,下自成蹊。”我相信,通过中国科学院一批科学家的辛勤耕耘,《中国科学院研究生教学丛书》将成为我国研究生教育园地的一丛鲜花,也将似润物春雨,滋养莘莘学子的心田,把他们引向科学的殿堂,不仅为科学院,也为全国研究生教育的发展做出重要贡献。

陈百祥



Joe Varner
1921-1995

Preface

The origin of this book lies with Joe Varner, who in the mid-1990s decided to develop a third edition of *Plant Biochemistry*, the highly successful textbook he had edited with James Bonner 30 years earlier. Unfortunately, Joe died before the wheels could be put in motion. Recognizing the need to maintain this important resource, the American Society of Plant Physiologists asked us to take on the project. We agreed, but soon found the scope growing beyond the bounds of a traditional biochemistry book.

Reflecting on the needs and future of the field, we concluded that for a contemporary biochemistry textbook to be of maximal use, it should present the biochemistry of plants in the context of relevant elements of their physiology and cellular and molecular biology. The ASPP leadership enthusiastically supported this concept, and the plan was thus put in place.

We have organized *Biochemistry and Molecular Biology of Plants* around the elements required for life: membranes, energy and metabolism, and reproduction. The first four of the five sections of the book follow this theme. The fifth section, however, represents a diversion and extends relevant scientific fundamentals to environmental aspects of biochemistry and biotechnology—dynamic areas in which the unique capabilities of plants are applied to solve contemporary societal problems.

The development and production of this book required the talent, expertise, and sustained effort of many individuals. We wish to highlight the efforts of the contributors, who not only admirably integrated information from diverse fields in composing the chapters, but also endured what seemed at times to be an unending series of editorial suggestions and revisions to both text and artwork. Thanks are in order to the able reviewers of the individual chapters; to the ASPP publications staff—both full-time and free-lance; to Kimberly Cline and Liz Burke, who coordinated the project from the University of California at Berkeley; and to the illustration and production staff at J/B Woolsey Associates.

We especially wish to acknowledge the outstanding contribution of Kathleen Vickers, our developmental editor. We are indebted to Kathleen not only for her perseverance and positive attitude in meeting an endless array of deadlines, but also for her unfailing vigilance to scientific accuracy and for her persistent efforts to integrate diverse material to make a whole from many parts. It is difficult to imagine completing this project without her.

Most important, we want to express appreciation to our wives, Melinda, Barbara, and Frances, who during the past four years not only tolerated the textbook, but came to accept it as a family member.

Bob B. Buchanan
Wilhelm Gruissem
Russell L. Jones

March 31, 2000
Berkeley, California

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A native Virginian, Bob B. Buchanan obtained his Ph.D. in microbiology at Duke University and did postdoctoral research at the University of California at Berkeley. In 1963, he joined the Berkeley faculty and is currently a professor in the Department of Plant and Microbial Biology. He has taught general biology and biochemistry to undergraduate students and graduate-level courses in plant biochemistry and photosynthesis. Initially focused on pathways and regulatory mechanisms in photosynthesis, his research has more recently dealt with the regulation of seed germination. This latter work is finding application in several areas.

Bob Buchanan has served as department chair at UC–Berkeley and was president of the American Society of Plant Physiologists from 1995 to 1996. A former Guggenheim Fellow, he is a member of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences and the American Association for the Advancement of Science. His other honors include the Bessenyei Medal from the Hungarian Ministry of Education, the Kettering Award for Excellence in Photosynthesis from the American Society of Plant Physiologists, and the Distinguished Achievement Award from his undergraduate alma mater, Emory and Henry College.

Wilhelm Gruissem

Wilhelm Gruissem was born in Germany, where he studied biology and chemistry and obtained his Ph.D. from the University of Bonn. He did postdoctoral research at the University of Marburg and the University of Colorado at Boulder, and in 1983 joined the faculty of the University of California at Berkeley. He chaired the Department of Plant and Microbial Biology at UC–Berkeley from 1993 to 1998, and since 1998 has been director of a collaborative research program between the department and the Novartis Agricultural Discovery Institute in San Diego. In July 2000, he will join the Swiss Federal Institute of Technology in Zürich as professor of plant biotechnology. He has taught general biology and plant molecular biology to undergraduate and graduate students. His research focuses on pathways and molecules involved in plant growth control and regulation of chloroplast development.

Willi Gruissem is an elected fellow of the American Association for the Advancement of Science and a member of several learned societies. He serves on the editorial boards of several professional journals and has received a number of honors and awards for his research program.

Russell L. Jones

Russell Jones was born in Wales and completed his B.Sc. and Ph.D. degrees at the University of Wales, Aberystwyth. He spent one year as a postdoctoral fellow at the Michigan State University–Department of Energy Plant Research Laboratory with Anton Lang before being appointed to the faculty of the Department of Botany at the University of California at Berkeley in 1966. He is now a professor of plant biology at UC–Berkeley, where he teaches undergraduate classes in general biology and graduate courses in plant physiology and cell biology. His research focuses on hormonal regulation in plants using the cereal aleurone as a model system, with approaches that exploit the techniques of biochemistry, biophysics, and cell and molecular biology.

Russell Jones was president of the American Society of Plant Physiologists from 1993 to 1994. He was a Guggenheim Fellow at the University of Nottingham in 1972, a Miller Professor at UC–Berkeley in 1976, a Humboldt Prize Winner at the University of Goettingen in 1986, and a RIKEN Eminent Scientist, RIKEN, Japan, in 1996.

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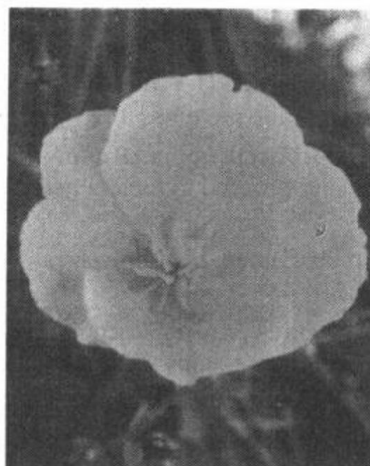
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