

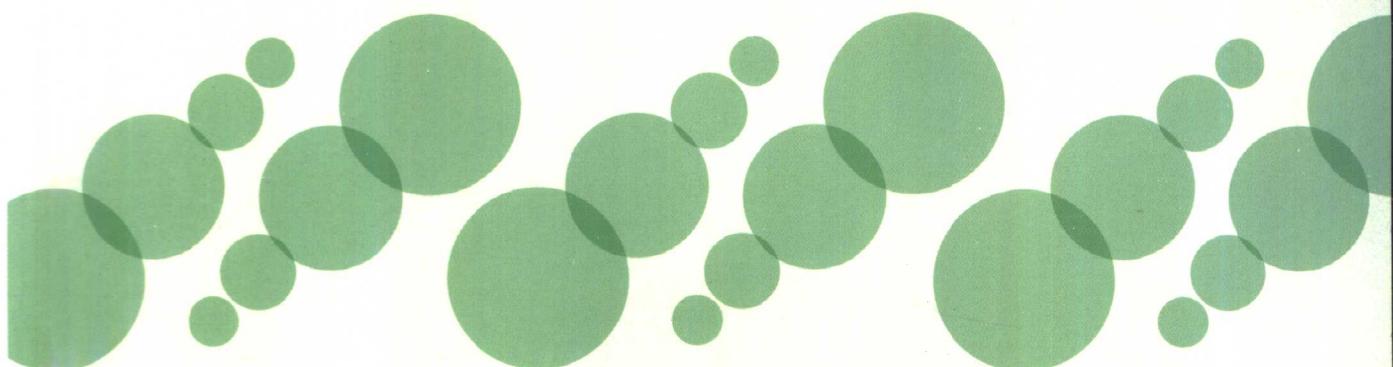
# 生命科学研究

2003年中国博士后生命科学学术研讨会暨院士论坛

Proceedings of 2003 Symposium of  
China Postdoctors and Academicians on Life Science

主编：夏家辉

Chief editor : XIA Jia-hui



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北京

## 内 容 简 介

本书为中国博士后科学基金会、中南大学和湖南省人事厅联合主办的“2003年中国博士后生命科学学术研讨会暨院士论坛”论文专辑，共收录论文110篇，涉及人类疾病、动物、植物和病毒等领域。内容分为9个专题，即：生命科学新进展、蛋白质和蛋白质组学与人类疾病、基因和基因组与人类疾病、纳米技术与基因、干细胞与组织材料、药物研究、中医药现代化、交叉学科研究和相关研究，充分展示了我国生命科学领域博士后研究人员的最新研究成果。

本书可供各大专院校、科研院所的研究人员参考，也可供大学图书馆、资料室、文献情报中心收藏。

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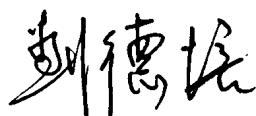
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## 序

随着人类基因组计划的完成，生命科学取得了重大进展。人类已进入生命科学时代，并预示着 21 世纪将是生命科学的世纪。各国科学家已将目光集中到高新生物技术方面。博士后是当今生命科学研究的主力军之一，其高度跨学科研究、广博的知识面和对高新技术的敏感性，无疑为生命科学研究注入了强大的活力。

广大博士后主持或参加了国家“973”、“863”、“十五”攻关等重大科研项目，在导师高起点、高质量地培养下，获得了可喜成果。由中国博士后科学基金会、中南大学、湖南省人事厅联合主办的“2003 年中国生命科学博士后学术研讨会暨院士论坛”历经一年筹备，共收到来自北京大学、清华大学、复旦大学和中南大学等国内近 40 所大学和科研院所有关生命科学研究的优秀论文 110 篇，涉及人类疾病、动物、植物和病毒等各领域。内容分生命科学新进展、蛋白质和蛋白质组学与人类疾病、基因和基因组与人类疾病、纳米技术与基因治疗、干细胞与组织材料、药物研究、中药现代化、多学科交叉和相关研究 9 个专题，充分展示了我国生命科学博士后研究人员的最新研究成果，颇具学术价值。为此，特将应征论文结集在科学出版社出版。该论文集的出版必将促进我国生命科学的研究水平的提高。



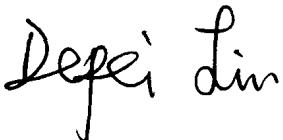
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2003 年 10 月于北京

## Preface

With the fulfilment of the Human Genomics Project, life science has obtained great development. This means that the mankind has entered the era of life science in the 21st century. So scientists from all over the world have been attaching importance to high bio-technology. With wide knowledge and a strong understanding of high-technology, postdoctors, one of the backbone elements in this field, have done a lot of research on borderline subjects, which has reinforced the research of life science.

With the help of academicians and famous experts, a large number of postdoctors have worked on important projects of national “973”, “863”, “10th Five Year Plan” and so on, and have made great achievements. After a year’s preparation for the “2003 Symposium of China Postdoctors and Academicians on Life Science”, which is co-sponsored by China Postdoctoral Science Foundation, Central South University and The Personnel Department of Hunan Province, we have accepted 110 excellent papers as to the subject from 37 universities and research institutes, such as Beijing University, Tsinghua University, Fudan University and Central South University. These papers involve the fields of human diseases, animals, plants and viruses, etc. The symposium will be divided into 9 columns: Advances in Life Science Research, Protein, Proteomics and Diseases, Genes, Genomics and Diseases, Nano-technology and Gene Therapy, Stem Cells and Tissue Materials, Pharmacological Study, Modernization of Traditional Chinese Medicine, Borderline Subjects and Correlated Research. It will show us the latest academic accomplishments of the postdoctors studying life science in China. And then, we have gathered the candidate papers into proceedings and published them in Science Press, which will further promote our research on life science.



Academician of Chinese Academy of Engineering  
Vice-president of Chinese Academy of Engineering  
President of Peking Union Medical University  
President of Chinese Academy of Medical Science  
Chairman of Academic Committee of the Symposium  
October 2003 Beijing

## 前 言

进入 21 世纪以来，生命科学已成为全世界最活跃的研究领域之一。我国从事生命科学的研究的博士后主持或参与了国家“973”、“863”、“十五”攻关等重大科研项目，并取得了一系列重要成果。为了进一步提高我国生命科学的研究水平，加强博士后之间的学术交流，促进学科发展，我们于 2002 年底向中国博士后科学基金会申请举办“2003 年中国博士后生命科学学术研讨会暨院士论坛”，并于 2003 年 4 月获得批准。会议由中国博士后科学基金会、中南大学和湖南省人事厅联合主办，由中南大学博士后管理办公室和中南大学博士后联谊会联合承办。

会议历经一年筹备，共收到来自北京大学、清华大学、复旦大学和中南大学等国内 37 所大学和科研院所有关生命科学的研究的高水平论文 110 篇，涉及人类疾病、动物、植物和病毒等各个方面。内容分为生命科学新进展、蛋白质和蛋白组学与人类疾病、基因和基因组与人类疾病、纳米技术与基因治疗、干细胞与组织材料、药物研究、中医药现代化、交叉学科研究和相关研究 9 个专题，展示了我国生命科学博士后研究人员的最新研究成果。此外，本次大会还将特别邀请从事生命科学的研究的院士和著名专家参加指导并做专题报告。

从大会的筹备到论文的结集出版由彭超群博士全盘负责组织实施；王东生博士、唐发清博士、肖长江博士、邹飞雁博士负责论文的审阅工作。此外，我们要特别感谢中南大学学术期刊中心张曾荣主任的大力支持和帮助；感谢中南大学学术期刊中心吴家泉、陈灿华、杨兵、袁赛前、杨华同志，他们为论文集的编校工作付出了辛勤劳动；感谢中南大学学术期刊中心排版室吴小燕、胡岚、贺建新、何柳同志，她们为论文集的排版和描图工作付出了辛勤劳动。

鉴于版面限制，我们对部分篇幅过长的论文未经作者同意做了少量删节，在此表示歉意。由于时间紧，任务重，且囿于我们的水平、能力和精力，在编校和出版过程中难免存在错漏和疏忽，敬请同行专家和与会者批评指正。

论文专辑编辑委员会  
2003 年 10 月

2003/10/11

# **Introduction**

Life science has become one of the hottest research fields in the 21th century. A large number of postdoctors in life science have worked on important projects of national “973”, “863”, “10th Five-year Plan” and so on, and have made great achievements. In order to intensify the academic exchanges between postdoctors and promote the development of life science disciplines, we applied the China Postdoctoral Science Foundation for “2003 Symposium of China Postdoctors and Academicians on Life Science” at the end of 2002, and were approved in April, 2003. The symposium is co-sponsored by the China Postdoctoral Science Foundation, Central South University and the Personnel Department of Hunan Province, and organized by the Postdoctors Administrative Office and Postdoctors Friendship Association of Central South University.

After a year's preparation, we accepted 110 excellent papers on life science from 37 universities and research institutes such as Beijing University, Tsinghua University, Fudan University and Central South University. These papers cover the fields of human diseases, animals and plants, and viruses, etc. The symposium will be divided into nine columns: Advances in Life Science Research, Protein, Proteomics and Diseases, Genes, Genomics and Diseases, Nano-technology and Gene Therapy, Stem Cells and Tissue Materials, Pharmacological Study, Modernization of Traditional Chinese Medicine, Borderline Subjects, and Correlated Research. Thanks to reputable academicians and renowned experts who have given us valuable advice, this symposium will show the latest academic accomplishments of postdoctors studying life science in China.

Dr. PENG Chao-qun covers the details from the preparation of the symposium to the publication of the proceedings. Dr. WANG Dong-sheng, Dr. TANG Fa-qing, Dr. XIAO Chang-jiang and Dr. ZHOU Fei-yan are responsible for the reading and correcting of the papers. In addition, we have received generous support from Mr. ZHANG Zeng-rong, Director of Academic Journal Center of Central South University. We have also got help from Mr. WU Jia-quan, Mr. CHEN Can-hua, Mr. YUAN Sai-qian, Ms. YANG Bing and Ms. YANG Hua, and from Ms. WU Xiao-yan, Ms. HU Lan, Ms. HE Jian-xin and Ms. HE Liu. We would like to devote great appreciation to the people mentioned above.

We would also like to express our sincere apologies to some writers because of alterations of their papers without informing them due to the limited space.

We realize that the proceedings are of course not without errors and oversights, due to the limitations in our human capabilities and time constraints. Therefore any comments and suggestions are warmly welcome.

**Editorial Committee of  
The Proceedings  
October, 2003**

# 生命科学研究

## ——2003年中国博士后生命科学学术研讨会暨院士论坛

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