

# 21世纪眼科学前沿

## THE FRONTIER OF OPHTHALMOLOGY IN THE 21ST CENTURY



主编 袁佳琴 林少明  
Chief Editors  
Yuan Jia-Qin  
Arthur Lim Siew Ming

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# 吴咸中院士题词

祝《21世纪眼科学前沿》出版：

携手共进，继往开来，  
为人类的光明事业而奋斗。

院士、教授 吴咸中



## INSCRIPTION

Congratulations to the publication:

"THE FRONTIER OF OPHTHALMOLOGY IN THE  
21ST CENTURY"

Go forward hand in hand, carry on the past and open a way for future.  
Fight against blindness to create a more magnificent future.

Academician & Professor Wu Xian-Zhong

## 内 容 提 要

本书为中国袁佳琴教授与新加坡林少明教授联合主编。邀请国内外百位以上著名眼科专家撰写。全书共 10 篇 87 章, 220 余万字, 插图 400 余幅。内容包括: 防盲、角膜、白内障、青光眼、视网膜、视神经、视交叉、外伤、近视和屈光手术、肿瘤、整形、药物、信息技术、基础研究及对 21 世纪的展望。作者除了论述其本人在 20 世纪的杰出贡献外, 还指出 21 世纪的发展方向。本书为中、英文对照, 深入浅出, 可供大专院校医学生、各级眼科医生、教学及研究人员以及防盲工作人员参考。

## Brief Introduction

Prof. Yuan Jia-Qin of China and Prof. Arthur S M Lim of Singapore jointly compile this book. More than one hundred famous ophthalmologists in the world are invited to contribute to this effort. This book comprises ten sections including 87 articles, more than tow millions words and more than 400 figures. It ranges over prevention of blindness, cornea, cataract, glaucoma, retina, optic nerve and optic chiasma, ocular trauma, myopia and refractive surgery, tumor, plastic surgery, pharmacology, information technology, fundamental research and the prospect to the 21st century. The authors point out the direction for the development of ophthalmology in the 21st century besides indicating their own contributions to the ophthalmology in the 20th century. This book is Chinese-English edition. It explains profound theories in simple language and could be the guide for the medical students of universities and colleges, ophthalmologists in different levels, teaching staff, researchers and personnel for prevention of blindness.



主 编 袁佳琴 林少明



## 袁佳琴教授简介

袁佳琴是中国天津医科大学眼科教授，博士生导师，世界人工晶体中国天津培训中心暨天津医科大学眼科中心的创建人。曾任中心主任，现为名誉院长。自1978年至今多次获国家及国际眼科组织的奖励，以表彰她对本国和世界眼科的发展及防盲工作所做的杰出贡献。曾任中华眼科学会副主席，现任亚太人工晶体学会副主席，世界眼科医师学会顾问委员会委员。

袁佳琴教授是中国工业眼科学研究的开创先锋。1956年她出版了《工业眼科学》；参与中华眼科学会眼外伤职业病学组的创建及杂志的创办；1982年出版了《眼裂隙灯显微学》。1998年出版了《人工晶体植入手术图谱》。

10年来在新加坡林少明教授的支持下，合作创建了世界人工晶体中国天津培训中心。至今已使治疗白内障的人工晶状体植入技术在中国得到普及，并已形成蓬勃发展的趋势。

袁佳琴教授主编了6部专著，参与撰写了13部专著。在国内外发表眼科论文100余篇。担任《中华眼科杂志》编委45年，还担任《亚-太眼科杂志》的编委。

## ABOUT PROF. YUAN JIA-QIN

Professor Yuan Jia-Qin, clinical Professor of Ophthalmology, is the founder and ex-director and present Honorary Director of the International Intraocular Implant Training Centre, Tianjin, China (IIITC) and Tianjin Medical University Eye Centre (TMUEC). Since 1978, she has received numerous awards in recognition of her vital contributions and meritorious service towards the work of ophthalmology, control of mass blindness and medical science by national and international organizations. She was Vice-President of the Chinese Ophthalmological Society from 1980 - 1984. In 1995, she was awarded by the Chinese Medical Association as “senior expert” for her distinguished achievement in ophthalmology. She is the Vice-President of Asia-Pacific Intraocular Implant Association and the member of the International Advisory Board of the World Eye Surgeons Association.

Prof. Yuan is the pioneer in the research of industrial ophthalmology in China and published her book entitled *Industrial Ophthalmology* in 1956. She undertook study in biomicroscopy of the eye and published her book *Slitlamp Microscopy of the Eye* in 1982

Under the initiative and great support of Prof. Arthur Lim of Singapore, through conjoint efforts, she successfully established the IIITC in 1989. Since then, implant surgery has been developed widely and rapidly in China.

Prof. Yuan is the author of 6 books including *An Atlas of Implant Surgery* published in 1998. She is also co-author of other 13 books on specific topics in Ophthalmology. She has published over 100 scientific papers. She has been the member of the editorial board of the Chinese Journal of Ophthalmology for 45 years. She is also a member of the editorial board of the Asia-Pacific Journal of Ophthalmology.



## 林少明教授简介

我认识林少明教授已经20多年了。我们第一次见面是1978年在新加坡举行的澳大利亚皇家眼科学会上。当时我孤身来到这个对我来说完全陌生的国家，林教授亲自接待了我，并把我介绍给他的同事，使我有宾至如归的感觉。但是，回想过去，我意识到不应为林教授当时为我所做的一切感到惊讶。因为这集中体现了他的人生态度和对世界眼科同行的诚挚关心。作为朋友、老师、医生、管理者、国际眼科事业的拥护者，林少明教授是如此的无私奉献，我们的同行中几乎无人能与之相比。

众所周知林教授为新加坡的眼科事业作出了杰出贡献。林教授在新加坡国立大学眼科以及新加坡国立眼科中心的发展中所起的关键性作用不仅造福了新加坡本国的人民，而且使邻近的亚太地区国家的患者也从中受益。他还参与了从欧洲引进FRCS眼科考试，此项测试是保证今后该地区眼科医生能力水平的一种措施。

林教授对于世界眼科学的突出贡献远远超出了新加坡的范围。他是亚太眼科学会（APAO）的主席、国际眼科学会及国际眼科学理事会的成员。他担任过新加坡举办的国际眼科大会的主席。林教授作为国际防盲组织的副主席及IAPB-SEA的地区主席，始终工作在防盲事业的前沿。旨在培训中国眼科医生掌握先进的白内障手术和人工晶状体植入技术而建立的世界人工晶体中国天津培训中心，即是他为防盲事业所投入的不懈努力和杰出领导才能的成功例证。

林教授发表了300余篇科学论文和10余本专著。他担任13种期刊的编辑，并且是亚太眼科杂志的主编。他是杰出的教育家和演讲家。

1997年，在我担任美国眼科学会主席期间，我的主题是“国际眼科学”，我的祝辞题为“同一个世界，同一个声音，同一个理想”——林教授正是这种精神的体现。

Stephen A. Obstbaum 教授

美国眼科学会前主席

## ABOUT PROF. ARTHUR LIM

I have known Arthur Lim for more than 20 years. Our first meeting was in Singapore in 1978 on the occasion of the Royal Australian College of Ophthalmologists meeting-the first I believe ever held outside Australia. Here I was alone in a country that was totally new to me. Arthur greeted me, introduced me to his colleagues and made me feel at home in this part of the world. But thinking back to that time I have learned that I should not have been amazed by Arthur's actions-because they epitomize his attitudes and sincere concerns for his colleagues worldwide. There are few in our profession who have been so giving as a friend, a teacher, a physician, an administrator and an advocate for international ophthalmology as Arthur Lim.

His distinguished career in Singapore is well-known to all of you. Arthur's pivotal role in developing the eye department at the National University of Singapore and the Singapore National Eye Center have benefited both the Singaporean population and patients in the neighboring countries of the Asia-Pacific region. He was also instrumental in bringing the FRCS examination in Ophthalmology to Singapore, as a means of assuring a level of competence for the future practitioners of this region.

It is also beyond the shores of Singapore that Arthur has made outstanding contributions to world ophthalmology. He has been a leader of the APAO, a member of the Academia Ophthalmologica Internationalis and of the International Council of Ophthalmology. In fact, he served as President of the International Congress of Ophthalmology meeting that was held in Singapore. Arthur has been at the forefront of prevention of blindness initiatives having been Vice President of the International Agency for the Prevention of Blindness and the Regional Chairman of IAPB-SEA. The International Intraocular Implant Training Center in Tianjin, established to train Chinese ophthalmologists in the current methods of cataract surgery and IOL implantation, is a shining example of the energy and dedicated leadership Arthur devoted to making this project a success.

Professor Lim has published more than 300 scientific papers and 10 books. He serves on the Editorial Boards of 13 journals and is the Editor-in-Chief of the Asia-Pacific Journal of Ophthalmology. He is an outstanding educator and lecturer.

In 1997, during my term as President of the American Academy of Ophthalmology, my theme was international ophthalmology and my message was **One World, One Voice and One Vision** — Arthur Lim is the embodiment of this aspiration.

**Prof. Stephen A. Obstbaum**

**Former President of the American Academy of Ophthalmology**

## 序

我非常高兴为《21世纪眼科学前沿》作序。

在我们跨入21世纪之际，我认为全世界的眼科同道们应当联合起来迎接这一新世纪对眼科的挑战。新世纪科学技术的发展，尤其是信息技术以及其他高新技术需要人们有敏锐的视力。另一方面，防盲治盲对全球人类的幸福都有重要意义。

袁佳琴和林少明两位教授是我多年的挚友。他们为21世纪共同撰写了这部书。他们邀请了包括中国、新加坡和其他许多国家在20世纪做出过杰出贡献的眼科专家参加撰写，其中许多专家也是我的挚友，例如中岛章，张士元教授等。本书是一部80多章共200百万余字的巨著，总结了20世纪后半期眼科主要方面的成就，指出了21世纪奋斗的方向。

如同世界奥林匹克运动会一样，世界眼科广大医生联合起来共同努力奋斗，年长的继续奉献，年轻的更富有潜力，一代胜似一代。21世纪眼科的发展更加日新月异。

我衷心地祝贺这部书的出版！预祝本书为人类的光明事业、人类的幸福生活做出贡献！

中华眼科学会前主席

李凤鸣 教授

## FOREWORD

I am very delighted to preface the new book entitled “The Frontier of Ophthalmology in the 21st century”.

On the occasion of stepping into the 21st century, I think all ophthalmological colleagues of the world should be united together to face such a fascinating challenge of the new era. The development of science and technology in the new century, especially the information technology and other latest technique need people's sharp vision. On the other hand, it is of great significance for the happiness of mankind to prevent and treat blindness.

Prof. Yuan Jia-Qin and Prof. Arthur Lim are both my intimate friends for a long time. They compile together this new book for the 21st century. They invited so many eminent ophthalmologists of the world from more than 20 countries including Singapore, China, Japan, United States of America, United Kingdom and etc. to contribute to the book. Many of them are my good friends, such as Prof. Akira Nakajima from Japan, Prof. Zhang Shi-Yuan from China. This great book collects 87 papers, more than tow million's words, that sum up the achievements of ophthalmology in the late half of the 20th century and points out the way for the development of the 21st century.

Just like Olympic games, all ophthalmologists of the world should be united to work hard. The old generation should continue to devote themselves to ophthalmology, the young generation are more energetic and have great potentialities. Generation after generation, the young overtake and surpass the old. I am sure the ophthalmology of the 21st century will be changing with each passing day.

I sincerely congratulate the publication of this book. Congratulate beforehand that this book will make a great contribution not only in spreading light for the mankind but also to the happy life of the people.

Professor Dorothy Lee Feng-Ming  
Former President of the Chinese Ophthalmological Society

## 前言

1998年底,林少明教授在中国北京之际,我们共同商讨编写一部眼科书,来迎接21世纪的挑战,经过两年多的时间,终于实现了这个愿望。

我们邀请的眼科专家年龄跨度超过半个世纪。他们有些是国际或国内眼科组织或学会的领导者。他们有些在眼科学的发展中已经做出重大贡献,有些将会有令人瞩目的成就。根据他们的专长,任意选择自己喜爱的专题,写出不同的文章。自1999年初至2000年6月底收到世界各地来稿。这些文章或全面论述纵观发展,或抓住重点深入研讨,在作者所从事的专业领域中指出21世纪的发展方向。这些文章不仅表达了作者智慧的精华,而且表现了对人类光明事业的执着追求。相信本书对世界眼科的发展将起到推动的作用。相信本书对促进国际文化交流,增进国际友谊,对世界和平进步也将做出贡献!

本书80余篇文章涉及面较广,包括:防盲、流行病学、医学伦理、成才之路、信息技术、现代眼科的基础理论与临床研究的新思路、新学说、新设计、新装备、新技术和新方法。文章中以白内障内容为最多,代表了20世纪后半期的热点;其次是青光眼、角膜病、屈光手术、视网膜疾病,表明这些问题是需要21世纪花大力气解决的。

本书为中、英文对照的版本。这样使全世界乃至中国基层的眼科医生们都能了解20世纪眼科的成就和21世纪的发展方向。虽然本书内容不是眼科医学的全面阐述,但可以看出本世纪眼科的重点发展趋势。翻译工作有一定的难度,既要忠实于作者,又要对读者负责。理解和表达要经历一番深思熟虑的过程,当然这远比不上作者的辛勤劳动。

相信本书的读者将会从本书中获得崭新的知识,并从中得到启迪,为21世纪的眼科发展做出贡献。

天津医科大学眼科中心

名誉院长 袁佳琴

## **PREFACE**

At the end of 1998, Prof. Arthur Lim, during his stay in Beijing, and I discussed together to compile a book on ophthalmology to face the challenge of the 21st century. After more than tow years, our desire has been realized.

The age span of the experts invited by us to join the compilation goes beyond half of the century. Some of them are top leaders of international or domestic ophthalmological organizations or societies. Some have made distinguished contributions in the development of ophthalmology in the world and some have fascinated accomplishments in future. All the authors can choose any topics, which they prefer, to write different articles according to their specialties. Some articles are overall expositions in many directions while others go deep into studies of focal points. Each author brings the bright prospect of his own field in the 21<sup>st</sup> century. Their treatises express not only the highlight of the anthors' wisdom but also the devotion that they perseveringly work for the cause of restoring light among humanity. I am confident that this book will further promote the development of world ophthalmology and make great contributions to the interflow of international culture, hence enhancing worldwide friendship and safeguarding world peace.

This book comprises 87 articles that range over prevention of blindness, epidemiology, medical ethics, information technology , ways to be achievers, new ideas, new theories, new designs in the fundamental theory and clinical research of modern ophthalmology, new equipments, new techniques and new methods. Cataract , a hot spot in the later half of the 20th century, has been extensively described in many papers. Glaucoma, cornea disease, refractive surgery, retinal disease follow closely. All problems above need to be researched further or settled by our assiduous effort and tremendous work in the 21st century.

The purpose of the Chinese-English bilingual edition is to let the whole world, especially ophathelmologists coming from grassroots of China, to learn outstanding achievements in the 20th century and direction of development in the 21st century. Though the contents of this book have not involved the comprehensive field of ophthalmology, it represents the essential trend of advance in this century. There are difficulties in translating. Because the translation should be true to the original as well as responsible for the readers. The understanding and expression of the original have to go through a course of careful consideration. Naturally, it can not match the hardworking of authors.

I am sure that the readers will be obtaining the latest knowledge, drawing inspiration from this book and will make great contribution to the development of ophthalmology in the 21<sup>st</sup> century.

Yuan Jia-Qin

Honorary President

Tianjin Medical University Eye Centre

International Implant Training Centre, Tianjing Chian

## 致谢

非常幸运，我们邀请了亚、澳、欧、美四大洲 14 个国家的 139 位作者参加撰写此书。他们具有非凡的天才，有为眼科事业奉献的精神，并取得了卓越的成就。他们是我们的亲密战友。20 位译者风华正茂，代表着眼科事业未来的希望。有这样杰出的写作、翻译队伍是我们的骄傲。

请允许我们对本书所有的作者、译者、编委，以及支持者天津市科协，韦秀丽女士、林曾宝玉夫人；帮助工作的步丰驹、孙静生、陈鲟、翟詹灿、宋鹏远、王道唯教授以及张楠、田欣、林松先生、于丽娜、王新、Julie Goh 女士；出版社社长王树泽先生、总编辑寇秀荣女士，责任编辑于素芝女士致以最诚挚的感谢。

袁佳琴 林少明

## ACKNOWLEDGEMENTS

To compile such a fascinating book, we are fortunate to have 139 authors from 14 countries distributed in Asia, Oceania, Europe and America with unique talents, invaluable experience and distinguished contributions to the ophthalmology. They are our intimate friends. We are also fortunate to have 20 translators who are not only young and promising but also the future of Ophthalmology. It is our proud to have such an outstanding team of writing and translating.

We are particularly indebted to all authors, translators, and editors, and also Tianjin Association for Science and Technology, Ms. Charity Wai, Mrs. Lim Chan Poh Geok, for their great supports and joining us in our book. We would like to thank Profs. Bu Feng-Ju, Sun Jing-Sheng, Chen Chang, Zhai Zhan-Can, Song Peng-Yuan, Wang Dao-Wei; Mr. Zhang Nan, Tian Xin, Lin Song; Ms. Yu Li-Na, Wang Xin, Julie Goh, who helped us to do a lot of works. At last we would like to show our sincere thanks to Mr. Wang Shu-Ze, the head of publishing house; Ms. Kou Xiu-Rong, the chief editor and Ms. Yu Su-Zhi, the editor-in-charge for this book, for their generous help.

Yuan Jia-Qin Arthur S M Lim



# 目 录

## 第一篇 引言

1. 辉煌的时代 ..... 林少明 ( 3 )
2. 世界防盲历史 ..... 中岛章 ( 16 )
3. 眼科医生在防盲工作中的重要作用 ..... Benjamin F Boyd ( 23 )
4. 中国白内障的流行病学 ..... 张士元 ( 28 )
5. 中国白内障扫盲概况 ..... 袁佳琴 ( 43 )
6. 信息技术对眼科学的影响 ..... Vivian Balakrishnan ( 61 )

## 第二篇 角膜

7. 破坏性角膜疾病的发病机理 ..... Peter G Watson ( 69 )
8. 中国的蚕蚀性角膜溃疡 - 临床特点  
和治疗的研 究 ..... 陈家祺 谢汉平 王 铮 杨 斌 ( 93 )
9. 眼表疾病 ..... 谢立信 史伟云 ( 106 )
10. 角膜缘潜在功能的开发应用 ..... 朱志忠 ( 128 )
11. 眼表面重建术及羊膜移植的应用 ..... 孙秉基 贺 焱 祝 磊 ( 144 )

## 第三篇 白内障

12. 白内障手术过去现状与未来 ..... Robert Sinskey Mihir Parikh ( 173 )
13. 白内障手术的未来 ..... Bradley R Straatsma Kevin M Miller ( 182 )
14. 为什么一些眼科医生术后少有并发症 ..... 林少明 ( 190 )
15. 白内障手术服务的数量与质量 ..... 李绍珍 许京京 何明光 吴开力 ( 206 )
16. 人工晶状体在 21 世纪的作用 ..... 王恺宁 王海旭 ( 212 )
17. 白内障手术表面麻醉的新进展 ..... 张 红 田 芳 ( 228 )
18. 现代手法微核白内障囊外摘除人工晶状体植入技术  
及其学习曲线 ..... Michael Blumenthal Ehud I Assia ( 237 )
19. 超声乳化技术实际操作须知: 并发症的原因预防和处理 ..... Graham D Barrett ( 249 )
20. 白内障超声乳化手术中的水分离 ..... 杨南淳 ( 258 )
21. 超声乳化 - 滑行法: 一项不用水分离的新技术 ..... 许福泉 李淑燕 谢佳霖 ( 264 )
22. 白内障铥激光乳化手术临床应用初步报告 ..... 陆国生 金怡萍 丁文天 ( 269 )
23. Choo-Choo 劈裂和翻转超声乳化技术 ..... I Howard Fine ( 277 )
24. 超乳前劈核技术 ..... Takayuki Akahoshi ( 288 )
25. 儿童白内障囊膜融合术 ..... Cosme IN Naval Carlos G Naval Jaime L Dinglasan  
Carmela Q Olivares Annelie A Sta Maria ( 323 )
26. Allergan Array 多焦人工晶状体的使用 ..... 胡光达 ( 347 )
27. 后极性白内障的超声乳化 ..... 李锐泉 ( 358 )
28. “L” 形不缝合巩膜隧道切口人工晶状体植入术 ..... 汤 欣 南 莉 孙慧敏 袁佳琴 ( 366 )
29. 恢复调节功能的白内障手术: 手术可行性的原则 ..... Rafael I Barraquer ( 377 )
30. 术后囊袋阻滞综合征 ..... 徐纯碧 ( 407 )
31. 超声乳化核下沉的玻璃体切割术 - 术后视力和并发症 ..... 康添寿 许福泉 王世源 ( 418 )

32. 眼内炎的预防 ..... 詹达强(426)
33. 应用超声生物显微镜观察眼内人工晶状体 ..... 宋维贤 杨文利(433)

#### 第四篇 青光眼

34. 青光眼的挑战 ..... 林少明(453)
35. 青光眼合并白内障手术的进展 ..... Stephen A Obstbaum (459)
36. 超声乳化并小梁切除术的最新技术 ..... Piers Percival Ashok Vyas Peter Bacon (471)
37. 青光眼的新进展 ..... 周德权(481)
38. 中国人原发性闭角型青光眼的研究进展 ..... 王宁利(489)
39. 原发性闭角型青光眼的病因和发病机理假说 ..... 贺忠江 闫一鸣(512)
40. 如何认识早期青光眼视野缺失 ..... 陈晓明(528)
41. 青光眼治疗新概念—神经保护 ..... 蒋幼琴 刘旭阳(541)
42. 最新的青光眼手术 ..... 谢佳霖(555)
43. 局限性氩激光虹膜周边成形术治疗原发性闭角型青光眼  
急性发作的初步研究 ..... 黎少明 谭志勇 林顺潮(560)
44. 现代经巩膜睫状体光凝术治疗青光眼 ..... 周德权 黄益民(571)

#### 第五篇 视网膜

45. 老年性黄斑变性的新进展 ..... 许福泉(581)
46. 黄斑皱裂 ..... 洪明宗(592)
47. 黄斑移位术 ..... 王世源(596)
48. 黄斑裂孔手术 ..... 李淑燕 王世源(600)
49. 眼内显微手术治疗漏斗状视网膜脱离的技术及效果 ..... 郭希让 李蕴随(608)
50. Eales 病 ..... S Natarajan Shyama Satyan (623)
51. 吲哚菁绿血管造影对隐匿性脉络膜新生血管的诊断 ..... 李筱荣 洪聪来(638)
52. 超声生物显微镜诊断前段增殖性玻璃体视网膜病变 ..... 刘文 吴启崇 黄素英 唐仕波(645)

#### 第六篇 视神经 视交叉

53. 视交叉的血液供养及双颞侧偏盲 ..... 劳远琇 高桦 钟勇(661)
54. 腰骶部椎管内肿瘤及视乳头水肿 ..... 劳远琇 张移 过慧君(673)
55. 管内段视神经损伤 ..... 过慧君 陈天周 燕江陵(687)

#### 第七篇 眼外伤

56. 严重眼外伤的救治和眼球结构功能重建 ..... 惠延年(699)
57. 眼内异物计算机绘图定位法 ..... 朱豫 张效房(712)
58. 眼内异物摘出晶状体玻璃体切除前囊前  
人工晶状体植入术 ..... 张效房 张金嵩 马静 黄文兵(724)

#### 第八篇 近视和屈光手术

59. 近视眼的预测 ..... 褚仁远 王晓瑛 李俊(741)
60. 近视眼的预防 ..... 汪芳润(758)
61. 有晶状体眼植入后房型人工晶状体矫正高度近视 ..... Joaquin Barraquer (772)