

国家“十一五”重点图书

(第39版)

格氏解剖学

GRAY'S Anatomy

The Anatomical Basis of Clinical Practice

临床实践的解剖学基础

主编

Susan Standring

主译

徐群渊



北京大学医学出版社

GRAY'S

格氏解剖学 (第 39 版)

THIRTY-NINTH EDITION

临床实践的解剖学基础

Gray's Anatomy: The Anatomical Basis of Clinical Practice, 39/E

Susan Standring

ISBN-13: 978-0-443-07168-3

ISBN-10: 0-443-07168-3

Copyright © 2005 by Elsevier Limited. All rights reserved.

Authorized Simplified Chinese translation from English language edition published by the Proprietor.

978-981-259-175-3

981-259-175-3

Elsevier (Singapore) Pte Ltd.

3 Killiney Road, #08-01 Winsland House I, Singapore 239519

Tel: (65) 6349-0200, Fax: (65) 6733-1817

First Published 2007

2007年初版

Simplified Chinese translation Copyright © 2007 by Elsevier (Singapore) Pte Ltd and Peking University Medical Press. All rights reserved.

Published in China by Peking University Medical Press under special agreement with Elsevier (Singapore) Pte. Ltd. This edition is authorized for sale in China only, excluding Hong Kong SAR and Taiwan. Unauthorized export of this edition is a violation of the Copyright Act. Violation of this Law is subject to Civil and Criminal Penalties.

本书简体中文版由北京大学医学出版社与Elsevier (Singapore) Pte Ltd在中国境内(不包括香港特别行政区及台湾)协议出版。本版仅限在中国境内(不包括香港特别行政区及台湾)出版及标价销售。未经许可之出口,是为违反著作权法,将受法律之制裁。

北京市版权局著作权合同登记号:图字:01-2006-0382

图书在版编目(CIP)数据

格式解剖学:39版/(英)斯坦丁(Standing,S.)著;
徐群渊译.—北京:北京大学医学出版社,2008

书名原文:Gray's Anatomy

ISBN 978-7-81116-306-3

I.格… II.①斯… ②徐… III.人体解剖学 IV.R322

中国版本图书馆CIP数据核字(2007)第160188号

格氏解剖学(第39版)

主 编: Susan Standring

主 译: 徐群渊

出版发行: 北京大学医学出版社(电话: 010-82802230)

地 址: (100083) 北京市海淀区学院路38号 北京大学医学部院内

网 址: <http://www.pumpress.com.cn>

E-mail: booksale@bjmu.edu.cn

印 刷: 北京圣彩虹制版印刷技术有限公司

经 销: 新华书店

责任编辑: 安林 赵曼 责任校对: 齐心 责任印制: 张京生

开 本: 889mm × 1194mm 1/16 印张: 112.5 字数: 3767千字

版 次: 2008年1月第1版 2008年1月第1次印刷

书 号: ISBN 978-7-81116-306-3

定 价: 1128.00元

版权所有, 违者必究

(凡属质量问题请与本社发行部联系退换)

译者名单

译者 (按翻译的章节前后顺序排列)

- 朱自强 (清华大学医学部 / 北京协和医学院基础医学研究所)
江小华 (首都医科大学北京神经科学研究所)
周 岩 (首都医科大学北京神经科学研究所)
郑德宇 (首都医科大学北京神经科学研究所)
徐长磊 (首都医科大学北京神经科学研究所)
马育平 (首都医科大学人体解剖学与组织胚胎学系)
王 伟 (首都医科大学人体解剖学与组织胚胎学系)
王 昊 (首都医科大学人体解剖学与组织胚胎学系)
刘 霞 (首都医科大学人体解剖学与组织胚胎学系)
刘承吉 (首都医科大学人体解剖学与组织胚胎学系)
孙冬旭 (首都医科大学人体解剖学与组织胚胎学系)
李 莉 (首都医科大学人体解剖学与组织胚胎学系)
李 慧 (首都医科大学人体解剖学与组织胚胎学系)
杨 琳 (首都医科大学人体解剖学与组织胚胎学系)
武 艳 (首都医科大学人体解剖学与组织胚胎学系)
常丽荣 (首都医科大学人体解剖学与组织胚胎学系)
梁元晶 (首都医科大学人体解剖学与组织胚胎学系)
方彬吉 (第三军医大学基础医学部人体解剖学教研室)
冯 飞 (第三军医大学基础医学部人体解剖学教研室)
刘光久 (第三军医大学基础医学部人体解剖学教研室)
刘继军 (第三军医大学基础医学部人体解剖学教研室)
吴 毅 (第三军医大学基础医学部人体解剖学教研室)
李 恺 (第三军医大学基础医学部人体解剖学教研室)
李七渝 (第三军医大学基础医学部人体解剖学教研室)
杨 进 (第三军医大学基础医学部人体解剖学教研室)
邱明国 (第三军医大学基础医学部人体解剖学教研室)
陈渝杰 (第三军医大学基础医学部人体解剖学教研室)
单锦露 (第三军医大学基础医学部人体解剖学教研室)

- 王 军 (中国医科大学人体解剖学教研室)
王慧君 (中国医科大学人体解剖学教研室)
田晓红 (中国医科大学人体解剖学教研室)
佟 雷 (中国医科大学人体解剖学教研室)
李 瑞 (中国医科大学人体解剖学教研室)
范 军 (中国医科大学人体解剖学教研室)
潘 峰 (中国医科大学人体解剖学教研室)
石献忠 (北京大学医学部解剖学与组织胚胎学系)
许媛媛 (北京大学医学部解剖学与组织胚胎学系)
何美华 (北京大学医学部解剖学与组织胚胎学系)
张 艳 (北京大学医学部解剖学与组织胚胎学系)
张卫光 (北京大学医学部解剖学与组织胚胎学系)
张书永 (北京大学医学部解剖学与组织胚胎学系)
陈庆山 (北京大学医学部解剖学与组织胚胎学系)
陈春花 (北京大学医学部解剖学与组织胚胎学系)
南 燕 (北京大学医学部解剖学与组织胚胎学系)
胡 琴 (北京大学医学部解剖学与组织胚胎学系)
赵 崢 (北京大学医学部解剖学与组织胚胎学系)
赵 靖 (北京大学医学部解剖学与组织胚胎学系)
栾丽菊 (北京大学医学部解剖学与组织胚胎学系)
秦丽华 (北京大学医学部解剖学与组织胚胎学系)
高 洁 (北京大学医学部解剖学与组织胚胎学系)
阎军浩 (北京大学医学部解剖学与组织胚胎学系)
雷季良 (北京大学医学部解剖学与组织胚胎学系)
裴群羽 (北京大学医学部解剖学与组织胚胎学系)
万 谨 (复旦大学上海医学院人体解剖与组织胚胎学系)
余沪荣 (复旦大学上海医学院人体解剖与组织胚胎学系)
俞亦龄 (复旦大学上海医学院人体解剖与组织胚胎学系)
高静琰 (复旦大学上海医学院人体解剖与组织胚胎学系)
文 灿 (第三军医大学基础医学部神经生物学教研室)
张艳玲 (第三军医大学基础医学部神经生物学教研室)
李淑蓉 (第三军医大学基础医学部神经生物学教研室)
李新枝 (第三军医大学基础医学部神经生物学教研室)
梁亚杰 (第三军医大学基础医学部神经生物学教研室)

原著编委名单

Editor-in-chief

Susan Standring PhD DSc

Professor of Experimental Neurobiology and Head, Division of Anatomy, Cell and Human Biology,

Guy's, King's and St Thomas' School of Biomedical Sciences, King's College London, London, UK

Lead Editors

Harold Ellis CBE MCh FRCS

Emeritus Professor of Surgery of the former Westminster Hospital Medical School,

Clinical Anatomist, Division of Anatomy, Cell and Human Biology,

Guy's, King's and St Thomas' School of Biomedical Sciences, King's College London, London, UK

Jeremiah C Healy MA MB BChir MRCP FRCR

Consultant Radiologist, Chelsea and Westminster Hospital, London, UK

David Johnson MA BM BCh DM FRCS(Eng)

Specialist Registrar in Plastic and Reconstructive Surgery,

Department of Plastic and Reconstructive Surgery, Radcliffe Infirmary, Oxford, UK

Andrew Williams MB BS FRCS FRCS (Orth)

Consultant Orthopaedic Surgeon, Trauma and Orthopaedics Department,

Chelsea and Westminster Hospital, London, UK

Theme Editors

Patricia Collins PhD

Associate Professor of Anatomy, Anglo-European College of Chiropractic, Bournemouth, UK

Caroline Wigley BSc PhD

Honorary University Teaching Fellow, The Peninsula Medical School, Exeter, UK

Editors

Barry KB Berkovitz BDS FDSRCS(Eng) MSc PhD
(Chapters 25, 27, 29-33, 35, 36 & 38)
Reader, Division of Anatomy, Cell and Human Biology,
Guy's, King's and St Thomas' School of Biomedical
Sciences,
King's College London, London, UK

Neil R Borley FRCS FRCS(Ed) MS
(Chapters 66-89 & 108)
Consultant Colorectal Surgeon,
Department of Gastrointestinal Surgery,
Cheltenham General Hospital,
Gloucestershire Hospitals NHS Trust, Cheltenham, UK

Alan R Crossman BSc PhD DSc
(Chapters 12, 13, 15-19 & 21-24)
Professor of Anatomy,
The University of Manchester, Manchester, UK

Mark S Davies MB BS FRCS FRCS(Orth)
(Chapter 115)
Consultant Orthopaedic Surgeon,
Guy's and St Thomas' Hospitals,
and The London Foot and Ankle Centre,
The Hospital of St John and St Elizabeth, London, UK

MJ Turlough FitzGerald MD, PhD, DSc, MRIA
(Chapter 20)
Emeritus Professor of Anatomy,
National University of Ireland, Galway, Ireland

Jonathan Glass MB BS FRCS(Urol)
(Chapters 91-101)
Consultant Urologist,
Guy's and St Thomas' Hospitals, London, UK

Carole M Hackney PhD
(Chapter 39)
Professor of Auditory Neuroscience,
MacKay Institute of Communication and Neuroscience,
School of Life Sciences, Keele University, Keele, UK

Thomas Ind MD MRCOG
(Chapters 102-107)
Consultant Gynaecological Surgeon,

Royal Marsden and St George's Hospitals, London, UK
Anthony R Mundy MS FRCP FRCS
(Chapters 91-101 & 108)
Professor of Urology,
Institute of Urology and Nephrology, London, UK

Richard LM Newell BSc MB BS FRCS
(Chapters 44-C46 & 110-114)
Clinical Anatomist, Cardiff School of Biosciences,
Cardiff University, Wales, and Honorary Consultant Ortho-
paedic Surgeon,
Royal Devon and Exeter Healthcare NHS Trust,
Exeter, UK

The late Gordon L Ruskell PhD
(Chapters 41 & 42)
Emeritus Professor, Department of Optometry and Visual
Science,
City University, London, UK

Pallav Shah MD FRCP
(Chapters 56-60 & 62-64)
Consultant Physician,
Royal Brompton Hospital, London, and
Department of Respiratory Medicine,
Chelsea and Westminster Hospital,
London, UK

前言

20世纪60年代中期当我还是一名伦敦盖氏医院医学院 (Guy's Hospital Medical School) 学生的时候, 解剖学一直被当成是基础医学学科的基石之一。我记得当时用的是第33版《格氏解剖学》--- 不是当作一本教材而是作为额外资料和细微图示的源泉 --- 它成了我的老朋友。我到现在还留着这本书并随时用作参考。譬如, 我在准备这一新版某些插图时就用到它。

经过了近四十年之后, 解剖学在过于繁重的本科医学课程体系中的位置已经不那么突显; 与此相反, 同一时期的研究生层次教育却对更详细解剖学知识的需求大大增加, 这特别受到图像和计算机辅助三维重建 (包括大体和显微镜)、麻醉学、内镜外科学以及仪器微型化等领域的进步所强化。解剖学家和临床专门家已经认识到要用新的视角来观察已经熟知的结构, 如关节腔在内镜下的表现、岩骨在高分辨率CT下的图像、磁共振图像引导下心血管导管介入治疗中的冠脉循环影像以及甲状腺的放射性核素图像等。

当我写这些话的时候, 我翻开了面前桌上Wilhelm Braune 所著的《局部解剖学图谱》英译本 (J & A Churchill公司出版, 1877), 里面有详尽的冷冻人体切面木版图, 其展示的细节堪与当代最新的断面解剖学图谱媲美。在《Braune 图谱》(1874年由Liesig [sic] 公司出版) 的译者前言中, 有一段话这样谈及解剖学在医学中的重要地位: “本图谱展示的切面图可以显示手术过程中那些必须区分或避开结构的准确位置和相互关系; 提出了某种枪击或刀刺可能伤及的范围。同时, 图谱提供了极其准确的胸腹脏器毗邻关系。”实际上, 对于从事操刀行业的临床医生来说, 这样的理念从来就没有改变过, 即解剖学知识仍然是他们武器库中最根本

的东西。

本39版《格氏解剖学》完全不同于较早的一些版本, 因为本版是按人体局部而不是按系统来描述的。一部理想的解剖学参考书似乎应该涵盖系统和局部解剖学两方面内容, 但出于实际考虑, 39版的编辑们认为一本能使临床工作者获益最多的书应该能反映他们日常的实践活动, 并按照他们的操作方式来描写解剖结构, 即从局部入手。这一看法也是我们在与世界各地的同仁们交流中听到最多的观点。正因为如此, 我们更新并澄清了有关文字内容, 特别关注了那些有导读作用及与临床相关的方面。

跟我一起准备本39版的编写人员都是有造诣的解剖学家或临床专家, 他们带来了多方面的丰富体验, 我对他们全体的奉献精神 and 热忱态度非常感激。牵头的编者 Harold Ellis、Jeremiah Healy、David Johnson 和 Andrew Williams 和我一道担负起监督本书特别章节的改写, 先是将第38版中不同章节的相关资料收集到一起, 然后是对各章节编写进行指导和建议。他们也帮助我对第39版的总体内容和编排方式进行了战略性布局。这样我们才增加了诸如皮肤和肌肉血液供应的描述, 因为在整形外科获取皮瓣时, 这些内容与手术密切相关; 同样我们也广泛使用了新的影像内容。文题编辑 Caroline Wigley 和 Pat Collins 与编辑团队所有成员密切配合, 分别更新了全书的显微结构和胚胎学内容。

对现有内容进一步更新并注入临床应用观念的任务则交给了章节编者, 他们是一群临床专家和解剖学家 (有的是身兼两家), 具有对医疗和口腔专业本科生、研究生讲授应用解剖学和神经解剖学的丰富经验。编者和专业撰稿人对有关章节注入了新思路, 诸

如涉及盆底、内耳、腹膜、着床前胚胎学、辅助授精、沿头颈筋膜界面扩散的感染、平滑肌和心肌、手腕运动学和动力学以及颞下颌关节等方面的解剖学内容。神经解剖学的内容也得到深入改编，以至其内容现在集中到了人类的神经系统。初稿完成后交给专业审读人（审阅特定章节）和非专业审读人（在初审中审阅书稿）进行了严格审查，这些审阅意见均已加入到了书稿之中。我对所有这些专家的鼓励和建议深表感谢。

全书的绘图和照片都尽可能标准化地显示身体的左侧，不管呈现的是人体的内侧面还是外侧面；对横切面则一律从其底面展示，以便与临床影像比较。本书还在一些地方选用了临床病理标本，这些地方的病理表现往往与解剖结构直接或间接相关，或者这些地方的解剖学特点可以用来对病理状况进行诊断、治疗处理。尽量选一些新的显微照片来图示人的组织学和胚胎学。我知道将以往版本中数目巨大的插图重新定向极大地增加了绘图人员的工作量，即要求他们改动上万条图标引线及相关名词的位置。我非常感谢 Michael Hutchinson 博士对这些改动所做的精细校对工作。毋庸置疑，尽管对文本和插图进行了反复多次校对，但是慧眼的读者还会让我修

正某些未能校出的谬误。

牵头的编者一致认为，《格氏解剖学》不是也不应该企图成为提供分子生物学、病理学、神经科学、生理学或外科操作步骤资料的书籍。不仅如此，鉴于篇幅有限，本书不是罗列实验数据的合适载体，也不对在专业性很强的专著中能够找到的内容进行详细描述。请注意，除了少数极短的章节外，参考文献都列在章节末尾以便引导读者深入阅读；对从题目下不易获取内容的论文或书刊都进行了标注。对通用教科书和有关多个章节都使用的资料如血管小体(angiosomes)的分布或其他基础医学内容的参考文献则一概放在 xv 页中。

我要感谢 Elsevier 公司的出版人员，他们先后在 Richard Furn (1999-2002) 和 Inta Ozols (2003-2004) 的领导下工作，感谢他们的悉心指导、专业技巧、幽默诙谐和无穷无尽的支持。在这种由团队协作完成的作品中，很难再专门提及每个人的工作。

我要记录下对 Alison Whitehouse, Colin Arthur, Martin Mellor 和 Lesley Small 的衷心感谢，感谢他们为我随时需要而从事的电话或 e-mail 联系。我还要感谢我那位受尽煎熬的丈夫 Guy Standing 在过去四年里对我的忍耐和宽容。

Susan Standing

2004 年 8 月

徐群渊 译

译者前言

《格氏解剖学》(Gray's Anatomy)自1858年问世以来一直是全世界最有影响力、最权威的解剖学著作。经过39次修订、再版,其内容已经远远超越了人体解剖学的传统概念,不单纯是讲述人体宏观结构的大体解剖学,还涉及细胞和分子生物学等方面内容,并用最新知识和思维解释了某些疾病的发病机理,提供了新的诊断和治疗方法,特别是结合解剖学知识介绍了一些新的行之有效的外科手术,大大拓宽了解剖学的理论内涵和应用范畴。本版是按能使临床工作者获益最多的方式编排即按人体局部而不是按系统来进行描述的,足以反映临床工作者日常的实践活动;这种按照实践者操作方式来描写解剖结构的模式,应能使人耳目一新。

全书图文并茂,内容全面;语言简明扼要,清晰易

懂,插图精美,是一部不论是从事基础生物医学还是临床实践领域的教学和研究工作者都需要必备的世界医学名著,对各类医学专业和学习生物专业的学生也有重要参考价值。

在北京大学医学出版社的大力支持下,我们组织北京大学医学部、复旦大学上海医学院、清华大学医学部/北京协和医学院、第三军医大学、中国医科大学、首都医科大学等院校活跃在教学、科研第一线的解剖科学专家和学者们共同翻译了这一巨著,希望能够获得广大读者的欢迎。鉴于参与翻译的学者特别是我本人的水平有限,各方面的错误实在有所难免,故热切希望广大读者能够及时提出批评指正。

徐群渊 中国解剖学会名誉理事长
于首都医科大学
2007年9月

原撰稿和审读专家名单

撰稿专家

Dr Leila Abbas

Whitfield Laboratory, Centre for Developmental Genetics,
Department of Biomedical Science, University of Sheffield,
Sheffield, UK

Dr Martin E Atkinson

Senior Lecturer, Department of Biomedical Science,
University of Sheffield, Sheffield, UK

Professor Clive Bartram

Consultant Radiologist, St Mark's Hospital,
Harrow, and Honorary Professor of Gastrointestinal
Radiology,
Faculty of Medicine, Imperial College, London, UK

Dr Gina Brown

Consultant Radiologist and Honorary Senior Lecturer,
The Royal Marsden Hospital NHS Trust, Surrey, UK

Professor Helen M Cox

Professor of Pharmacology, Centre for Neuroscience
Research,
Guy's, King's and St Thomas' School of Biomedical
Sciences,
King's College London, London, UK

Dr Wolfgang Hamann

Senior Lecturer in Pain Management,
Guy's, King's and St Thomas' School of Biomedical
Sciences,
Pain Management Centre, St Thomas' Hospital, London,
UK

Mr Simon A Hickey

Consultant ENT Surgeon, ENT Department,
Torbay Hospital, Devon, UK

Professor John D Langdon

Department of Maxillofacial Surgery,
Guy's, King's and St Thomas' Dental Institute,

King's College Hospital, London, UK

Miss Vivien C Lees

Consultant Plastic and Hand Surgeon,
Department of Plastic Surgery, Wythenshawe Hospital,
Manchester, UK

Dr Daniel E Lieberman

Professor of Anthropology, Peabody Museum,
Harvard University, Cambridge, USA
Professor Vishy Mahadevan
The Royal College of Surgeons of England, London, UK

Professor BJ Moxham

Professor of Anatomy and Deputy Director (Head of
Teaching) in Biosciences, Cardiff School of Biosciences,
Cardiff University,
Cardiff, UK

Professor Jeff Osborn

Professor Emeritus, Faculty of Dentistry, University of
Alberta,
Alberta, Canada

Dr Ruth Richardson

Research Associate, Centre for Medical Humanities,
University College London, and The Wellcome Trust Centre
for
The History of Medicine at University College London, London,
UK

Mr Gregory P Sadler

Consultant Endocrine Surgeon, John Radcliffe Hospital,
Oxford, UK

Dr Allan Thexton

[Formerly] Division of Physiology,
Guy's, King's and St Thomas' School of Biomedical
Sciences,
King's College London, London, UK

Mr Giles Toogood

Consultant Hepatobiliary Surgeon,
St James's University Hospital, Leeds, UK

主要审读人

Dr Michael A Adams

Senior Research Fellow, Department of Anatomy,
University of Bristol, Bristol, UK

Professor Tipu Aziz

Consultant Neurosurgeon, Radcliffe Infirmary, Oxford,
and Charing Cross Hospital, London, UK

Mr John Bidmead

Consultant Urogynaecologist, King's College Hospital,
London, UK

Professor Peter Braude

Head of Department of Women's Health,
Guy's, King's and St Thomas' School of Medicine,
St Thomas' Hospital, London, UK

Dr Robert Brooks

Lecturer, Division of Anatomy, Cell and Human Biology,
Guy's, King's and St Thomas' School of Biomedical
Sciences,
London, UK

Dr Paul Cartwright

Consultant Anaesthetist, Derby City Hospital, Derby, UK

Dr Fred Cody

Senior Lecturer, The University of Manchester, Manchester,
UK

Mr Steven A Corbett

Consultant Orthopaedic Surgeon,
Guy's and St Thomas' Hospitals NHS Trust, London, UK

Mr Michael Dilkes

Consultant Ear, Nose and Throat Surgeon, and Honorary
Senior Lecturer, St Bartholomew's Hospital, London, UK

Dr Michael A Gatzoulis

Consultant Cardiologist, Director, Adult Congenital Heart
Unit,
Royal Brompton Hospital, London, UK

Professor Paul Griffiths

Professor of Radiology, University of Sheffield,
Royal Hallamshire Hospital, Sheffield, UK

Dr Mike Hall

Consultant Neonatologist, and Honorary Senior Clinical Lec-
turer in Child Health, Princess Anne Hospital, Southampton,
UK

Dr Michael Hutchinson

Clinical Anatomist, Division of Anatomy, Cell and Human
Biology, Guy's, King's and St Thomas' School of Biomed-
ical Sciences,
King's College London, London, UK

Professor Alan Jackson

Professor of Neuroradiology,
Department of Imaging Science and Biomedical
Engineering,
The University of Manchester, Manchester, UK

Dr Mark Johnson

Senior Lecturer, Obstetrics and Gynaecology,
Chelsea and Westminster Hospital, Imperial College School
of Medicine at Chelsea and Westminster Hospital, London,
UK

Dr Jonathan C Kentish

Reader in Pharmacology,
Centre for Cardiovascular Biology and Medicine,
King's College London, The Rayne Institute,
St Thomas's Hospital, London, UK

Professor Birgit Lane

Cox Professor of Anatomy and Cell Biology,
Cancer Research UK Cell Structure Research Group,
Division of Cell and Developmental Biology,
University of Dundee School of Life Sciences, Dundee, UK

Professor Andres Lozano

Professor and R R Tasker Chair in Neurosurgery,
Division of Neurosurgery, Toronto Western Hospital,
University of Toronto, Toronto, Canada

Dr Alison McGregor

Senior Lecturer in Biodynamics, Division of Surgery,
Anaesthetics and Intensive Care, Faculty of Medicine,
Imperial College, Charing Cross Hospital, London, UK

Professor Peter Morgan

Professor of Oral Pathology and Honorary Consultant,
Guy's, King's and St Thomas' Hospitals Dental Institute,
London, UK

Professor David Neary

Professor of Neurology, Department of Neurology,
Hope Hospital, Salford, UK

Professor John Pepper

Professor of Cardiac Surgery, Imperial College School of
Medicine, London, and Consultant Surgeon, Department of
Surgery,
Royal Brompton Hospital, London, UK

Dr Susan Pickering

Senior Lecturer, Women's Services, King's College London,
Division of Women's Health, Guy's and St Thomas'
Hospitals, London, UK

Professor Mary Ritter

Director, Graduate School of Life Sciences and Medicine,
Department of Immunology, Division of Medicine,
Imperial College, London, UK

Dr Anthea Rowleron

Lecturer in Physiology, Guy's, King's and St Thomas'
School of Biomedical Sciences, London, UK

Professor Jeremy PT Ward

Professor of Respiratory Cell Physiology,
Department of Asthma, Allergy and Respiratory Science,
King's College London, London, UK

Mr David Woods

Consultant Orthopaedic Surgeon, Great Western Hospital,
Swindon, UK

Professor Stuart Stanton

Emeritus Professor, St George's Hospital Medical School,
London, UK

普通审读人**Riaz Agha**

Guy's, King's and St Thomas' School of Biomedical
Sciences,
King's College London, London, UK

Professor Kirby I Bland

Professor and Chairman, Department of Surgery,
Deputy Director of the Comprehensive Cancer Center,
University of Alabama at Birmingham, Birmingham, USA

Professor John D Corson

Professor of Vascular Surgery,
University of Iowa Health Care, Iowa City, USA

Professor Charles Cummings

Andelot Professor, Otolaryngology-Head and Neck
Surgery,
The Johns Hopkins Hospital, Baltimore, USA

Professor Daniel J Deziel

Senior Attending Surgeon at Rush-Presbyterian-St. Luke's
Medical Center, Professor of Surgery at Rush Medical
College,
Chicago, USA

Mr David Evans

Consultant Hand Surgeon and Director,
The Hand Clinic, Windsor, and Honorary Consultant Hand
Surgeon,
The Royal National Orthopaedic Hospital, London, UK

Professor Mark K Ferguson

Professor of Surgery, University of Chicago, Chicago, USA

Professor Lee A Fleisher

Professor and Chair of Anesthesia, Professor of Medicine,
University of Pennsylvania School of Medicine,
Philadelphia, USA

Professor Thomas R Gest

Associate Professor of Anatomy,
Director of the Anatomical Donations Program,
University of Michigan Medical School, Office of Medical
Education, Ann Arbor, USA

Dr Duaine Haines

Chairman and Professor of Anatomy,
University of Mississippi Medical Center, Jackson, USA

Dr Rajeev M Joshi

Professor of Surgery, LTM Medical College, Mumbai, In-
dia

Dr John Paul Judson

Associate Dean (VMU) and Associate Professor of Human
Biology, Cells and Molecules, International Medical
University,
Kuala Lumpur, Malaysia

Professor Subramaniam Krishnan

Head of Department of Anatomy, Faculty of Medicine,

University of Malaya, Kuala Lumpur, Malaysia

Professor Ling Eng Ang

Head of Department of Anatomy, National University of Singapore, Singapore

Professor Nancy M Major

Associate Professor of Radiology,
Duke University Medical Center, Durham, USA

Professor Suleman Merchant

Head, Department of Radiology and Imaging,
LTM Medical College and General Hospital, Mumbai, India

Professor Gillian Morriss-Kay

Department of Human Anatomy and Genetics,
University of Oxford, Oxford, UK

Dr Ian Parkin

Clinical Anatomist, Department of Anatomy,

Cambridge University, Cambridge, UK

Professor Thomas H Quinn

Professor of Anatomy, Creighton University School of Medicine,
Omaha, USA

Dr Lakshmi Selvaratnam

Department of Anatomy, Faculty of Medicine,
University of Malaya, Kuala Lumpur, Malaysia

Professor Roger Soames

Associate Professor and Head of Anatomy,
School of Biomedical Sciences, James Cook University,
Townsville, Australia

Dr Anil H Walji

Professor and Director, Division of Anatomy,
Professor of Radiology and Diagnostic Imaging,
Faculty of Medicine and Dentistry, University of Alberta,
Edmonton, Canada

致 谢

We are indebted to Dr Michael Hutchinson for checking the labelling and placement of labels in anatomical illustrations across the book.

New photography commissioned for this edition

We thank Sarah-Jane Smith for the following photos

Microstructure: 3.4, 3.10, 3.15, 3.17, 3.19, 5.2, 5.4A–F, 5.6, 5.8, 5.12, 5.13, 5.14, 5.18, 6.6, 6.15, 6.17, 6.19A, 6.20, 6.28, 6.29, 6.37, 6.42, 6.48, 7.15, 7.17, 8.4, 8.8, 8.11, 8.13, 8.14, 8.16, 8.17, 9.1, 9.2, 9.3, 17.1, 21.14, 21.15, 31.31, 33.40, 33.41, 58.3, 71.16A, 71.17, 72.1, 75.3, 75.4, 85.16, 86.5, 88.6, 88.7, 89.4, 89.6, 96.3, 104.6.

Osteology: 45.11, 45.17, 45.18, 45.19, 45.21, 45.22, 45.23, 45.24, 45.26, 45.31, 45.32, 45.33A, 45.34, 49.1A,B, 49.3, 49.4, 49.5, 49.6, 49.8A,B, 49.9A,B, 49.10A,B, 49.11, 52.5, 52.6, 52.7, 52.8, 52.12, 57.4A,B, 57.7, 57.8, 57.9A,B, 57.10A,B, 57.11A,B, 111.4A,B, 111.5A,B, 111.6, 111.15A,B, 111.16A,B, 111.17, 111.18, 111.19, 113.5, 113.6, 113.13, 114.1A,B, 114.2A,B, 114.5.

Surface anatomy: 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.7, 25.8, 44.1, 44.2, 44.3, 48.14, 48.15, 48.16A–C, 48.17, 56.3, 110.12, 110.13, 110.14, 110.15, 110.16, 110.17, 110.18, 110.19, 110.20, 110.21, 110.22, 110.24, 110.25, 110.26, 110.27.

Diagrammatic overlays for figures: 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.7, 25.8, 110.12, 110.13, 110.14, 110.15, 110.16, 110.17, 110.18, 110.20, 110.21, 110.22, 110.24.

Previously published illustrations

Within individual figure captions, we have acknowledged all figures kindly loaned from other sources. However, we would particularly like to thank the following authors who have generously loaned so many figures from other books published by Elsevier:

Microstructure:

Kerr JB 1999 *Atlas of Functional Histology*. London: Mosby.

Figures 3.8, 3.9, 3.14, 4.23, 6.11, 7.5, 7.18, 7.21, 33.12B, 58.2B, 59.23, 71.18, 72.5, 85.14, 85.15, 87.7, 88.5, 91.17, 97.5A, 102.8, 103.5.

Kierszenbaum AL 2002 *Histology and Cell Biology: An Introduction to Pathology*. St Louis: Mosby.

Figures 3.6, 3.11, 4.16, 6.25, 8.3, 8.5, 32.5, 33.42, 59.17, 62.2, 62.3, 71.15, 96.4A,B, 97.7, 104.5.

Stevens A, Lowe JS 1996 *Human Histology*, 2nd edn. London: Mosby.

Figures 2.9, 2.17, 4.17, 31.30, 32.6, 62.5, 91.22, 92.4, 102.6, 102.9.

Young B, Heath JW 2000 *Wheater's Functional Histology: A Text and Colour Atlas*, 4th edn. Edinburgh: Churchill Livingstone

Figures 2.4, 2.5B, 2.12, 2.15, 2.16A,B, 2.18B, 2.24, 3.2, 3.3, 3.13, 3.16, 4.1, 4.10B,C, 5.11, 5.17, 6.41, 7.10, 7.20, 33.10, 33.11, 35.7A, 42.15, 58.5, 62.7, 62.8, 62.9, 72.3, 85.18, 91.19, 91.20, 97.4, 102.10.

Head and neck:

Berkovitz BKB, Holland GR, Moxham BJ 2002 *Oral Anatomy, Embryology and Histology*, 3rd edn. Edinburgh: Mosby.

Figures 33.2, 33.12A, 33.18B–E, 33.25, 33.26, 33.28, 33.29, 33.30, 33.32, 33.34, 34.10D, 35.12, Table 33.1.

Berkovitz BKB, Moxham BJ 1994 *Color Atlas of the Skull*. London: Mosby-Wolfe.

Figures 27.1, 27.3, 27.4, 27.5, 27.7, 27.8, 27.9, 27.10, 27.11, 27.13, 27.14, 27.16, 27.17, 27.19, 27.20, 27.21, 27.22, 27.23, 27.24, 27.25, 27.27, 27.28, 32.1, 32.2, 33.16.

Surface anatomy:

Lumley JSP 2002 *Surface Anatomy: the Anatomical Basis of Clinical*

Examination, 2nd edn. Edinburgh: Churchill Livingstone.
 Figures 27.2, 27.6, 41.15, 41.16, 48.13A,B, 48.18B, 56.1,
 56.2, 56.4, 66.1, 66.2, 66.3, 66.4, 110.23.

Diagrammatic overlays for figures 25.1, 25.2, 25.3, 25.4,
 25.5, 25.6, 25.7, 25.8, 110.12, 110.13, 110.14, 110.15, 110.
 16, 110.17, 110.18, 110.20, 110.21, 110.22, 110.24.

NEW ILLUSTRATIONS COMMISSIONED FOR THIS EDITION

We thank the illustrators for their valuable contribution to the new edition

Antbits: 1.1, 16.3, 16.11, 19.16, 19.18, 41.13, 59.1. All of surface anatomy and bones overlays.

Robert Britton: 2.1, 2.3, 2.5A, 2.6, 2.11, 2.18A, 2.22, 2.23, 3.1, 3.12, 4.11, 4.12, 4.27, 6.39, 7.3, 8.5, 8.12, 8.20, 8.22, 12.40, 21.3, 30.8, 30.11, 33.39, 39.22, 42.17, 42.19, 42.23, 59.18, 62.1, 62.6, 65.5, 71.14, 85.17, 87.6, 87.8, 102.5, 105.8, 110.29, 110.30, 110.31.

Graeme Chambers: 53.32.

Michael Courtney: 17.6, 17.7, 17.13, 17.15, 17.16, 45.50, 45.51, 45.52, 45.53, 45.55, 45.56, 45.57, 48.5, 49.16, 49.18, 49.21, 49.23, 49.24, 50.1, 50.2, 50.3, 50.4, 51.1, 51.9, 51.11, 51.12, 52.1, 52.2, 52.3, 52.9, 52.15, 52.16, 52.17, 52.18, 52.19, 52.20, 52.21, 52.22, 52.23, 53.2, 53.3, 53.4, 53.12, 53.34, 53.36, 53.37, 53.38, 53.40, 53.42, 53.43, 53.51, 53.52, 53.53, 53.55, 53.56, 53.58, 53.59, 63.5, 63.13, 64.3, 113.19, 115.1, 115.7, 115.17, 115.37, 115.42.

Peter Cox: 13.3, 13.15, 15.6, 15.10, 15.12, 16.2, 23.4, 23.5, 23.9, 23.12, 23.15, 23.16, 24.4, 24.5.

Ethan Danielson: 4.19, 6.49, 10.22, 10.23, 10.24, 11.1, 11.

cover illustration

An oblique paracoronal shaded volume-rendition slab image of the head and neck superimposed on a photograph of a young male subject, posterior view. The image was derived from a coronally acquired T1-weighted volumetric magnetic resonance dataset: it was produced using a Voxar 3D workstation (Voxar Ltd, Edinburgh, Scotland).

Image supplied by Dr RJS Chinn, Consultant Radiologist, Chelsea and Westminster Hospital, London, UK.

4, 11.5, 11.6B, 12.2, 14.5, 14.15, 14.26, 14.27, 14.28, 15.3, 18.10, 18.11, 18.12, 19.1, 19.17, 20.4, 20.6, 20.7, 20.8, 20.9, 20.10, 20.11, 20.12, 20.13, 20.14, 20.15, 22.30, 23.14, 26.6, 29.10, 31.18, 34.5, 34.8, 38.11, 45.1, 45.2, 45.5, 46.12, 47.6, 47.8, 47.9, 47.10, 48.1, 48.4, 49.27, 49.29, 54.2, 54.3, 57.1, 57.2, 61.3, 65.1, 72.4, 85.3, 89.5, 90.3, 90.5, 90.6, 91.12, 91.15, 97.6, 105.3, 109.1, 109.2, 109.3, 109.4, 109.5, 109.6, 109.7, 109.11, 109.12, 109.13, 109.14, 109.15, 109.16, 109.18, 109.19, 109.20, 110.4, 110.5, 110.9.

Brian Evans: 15.1, 15.3, 29.3, 29.15, 31.1, 31.4, 31.9, 31.26, 33.7, 41.4, 41.6, 76.1, 76.10, 76.11, 76.14, 76.16, 76.17, 82.1, 82.2, 83.8, 83.9, 108.2, 108.3, 108.9, 108.11, 108.12.

Sandie Hill: 35.2, 35.11A, 36.1, 36.2, 36.3, 36.4, 36.6, 36.7, 36.8, 36.9, 36.10, 36.11, 36.13, 36.14, 36.15, 67.4, 67.5B, 67.6B, 67.12, 67.13, 67.15, 67.16, 71.2, 71.11A,B, 73.1, 84.1, 84.3, 84.5B, 84.6A, 84.7, 85.1, 85.2, 85.3, 85.5, 85.12, 86.1, 87.2, 87.3, 87.4, 87.8.

Bruce Hogarth: 8.28, 16.5, 16.6, 16.9, 18.23, 19.13, 19.14, 19.23, 22.1, 22.3, 22.6, 29.2, 44.4, 45.3, 45.4, 48.6, 48.8, 53.34, 71.1, 71.3, 71.5, 71.8, 71.10, 71.12, 110.3, 110.28.

Gillian Lee: 6.33, 6.34, 6.35, 6.36, 31.2, 31.16, 32.3, 32.8, 33.43, 41.3, 41.22, 60.17, 63.1, 63.11, 63.34C, 69.2, 69.7, 92.2.

Gillian Oliver: 71.4.

Philip Wilson: 30.10, 44.6, 44.8, 45.5, 45.6, 45.10, 45.13, 45.14, 45.38, 45.41, 45.43, 45.44, 46.8, 46.11, 46.13, 49.9, 57.21, 58.4, 67.7, 68.1, 68.3, 68.4, 68.8, 68.12, 68.15, 76.15, 80.1, 92.3, 111.21.

主要参考书目

The following references contain information relevant to numerous chapters in this edition. They are therefore cited here rather than at the end of individual chapters.

TERMINOLOGY

Federative Committee on Anatomical Terminology 1998 Terminologia Anatomica. International Anatomical Nomenclature. Stuttgart: Thieme.

Dorland, 2003, Dorland's Illustrated Medical Dictionary, 30th edn. Philadelphia: W B Saunders.

BASIC SCIENCES

Abrahams PH, Marks SC Jr, Hutchings R 2002 McMinn's Colour Atlas of Human Anatomy, 5th edn. London: Churchill Livingstone.

Alberts B, Johnson A, Lewis J, Raff M, Roberts K, Walter P 2002 Molecular Biology of the Cell, 4th edn. New York: Garland Science Publishing.

Berkovitz BKB, Kirsh C, Moxham BJ, Alusi G, Cheeseman T 2002 Interactive Head and Neck. London: Primal Pictures.

Boron W, Boulpaep E 2002 Medical Physiology. Philadelphia: W B Saunders.

Crossman AR, Neary D 2000 Neuroanatomy, 2nd edn. Edinburgh: Churchill Livingstone.

Fitzgerald MJT, Folan-Curran J 2001 Clinical Neuroanatomy and Related Science, 4th edn. Edinburgh: Churchill Livingstone.

Guyton AC, Hall JE 1996 Human Physiology and Mechanisms of Disease, 6th edn. Philadelphia: W B Saunders.

Kerr JB 1999 Atlas of Functional Histology. London: Mosby.

Kierszenbaum AL 2002 Histology and Cell Biology: An

Introduction to Pathology. St Louis: Mosby.

Moore KL, Persaud TVN 2003 Before We Are Born: Essentials of Embryology and Birth Defects, 6th edn. Philadelphia: WB Saunders.

Pollard TD, Earnshaw WC 2002 Cell Biology. Philadelphia: WB Saunders.

Roitt I, Brostoff J, Male D 2001 Immunology, 6th edn. London: Mosby.

Salmon M 1994 Anatomic Studies: Book 1 Arteries of the Muscles of the Extremities and the Trunk, Book 2 Arterial Anastomotic Pathways of the Extremities. Ed. by Taylor G, Razaboni RM. St Louis: Quality Medical Publishing Inc.

Stevens A, Lowe JS 1996 Human Histology, 2nd edn. London: Mosby.

Young B, Heath JW 2000 Wheater's Functional Histology: A Text and Colour Atlas. Edinburgh: Churchill Livingstone.

Imaging and radiology/radiological anatomy

Butler P, Mitchell AWM, Ellis H 1999 Applied Radiological Anatomy. New York: Cambridge University Press.

Ellis H, Dixon A, Logan BM 1999 Human Sectional Anatomy: Atlas of Body Sections, CT and MRI Images, 2nd edn. Oxford: Oxford University Press.

Haaga JR, Lanzieri CF, Gilkeson RC 2002 CT and MR Imaging of the Whole Body, 4th edn. St Louis: Mosby.

Lasjaunias P, Berenstein A, ter Brugge K 2001 Surgical Neuroangiography, vol 1. Clinical Vascular Anatomy and Variations, 2nd edn. Berlin, New York: Springer.

Meyers MA 1994 Dynamic Radiology of the Abdomen: Normal and Pathologic Anatomy, 4th edn. New York: Springer.

Pomeranz SJ 1992 MRI Total Body Atlas. Cincinnati: MRI-EFI Publications.

Sutton D 2002 Textbook of Radiology and Imaging, 7th