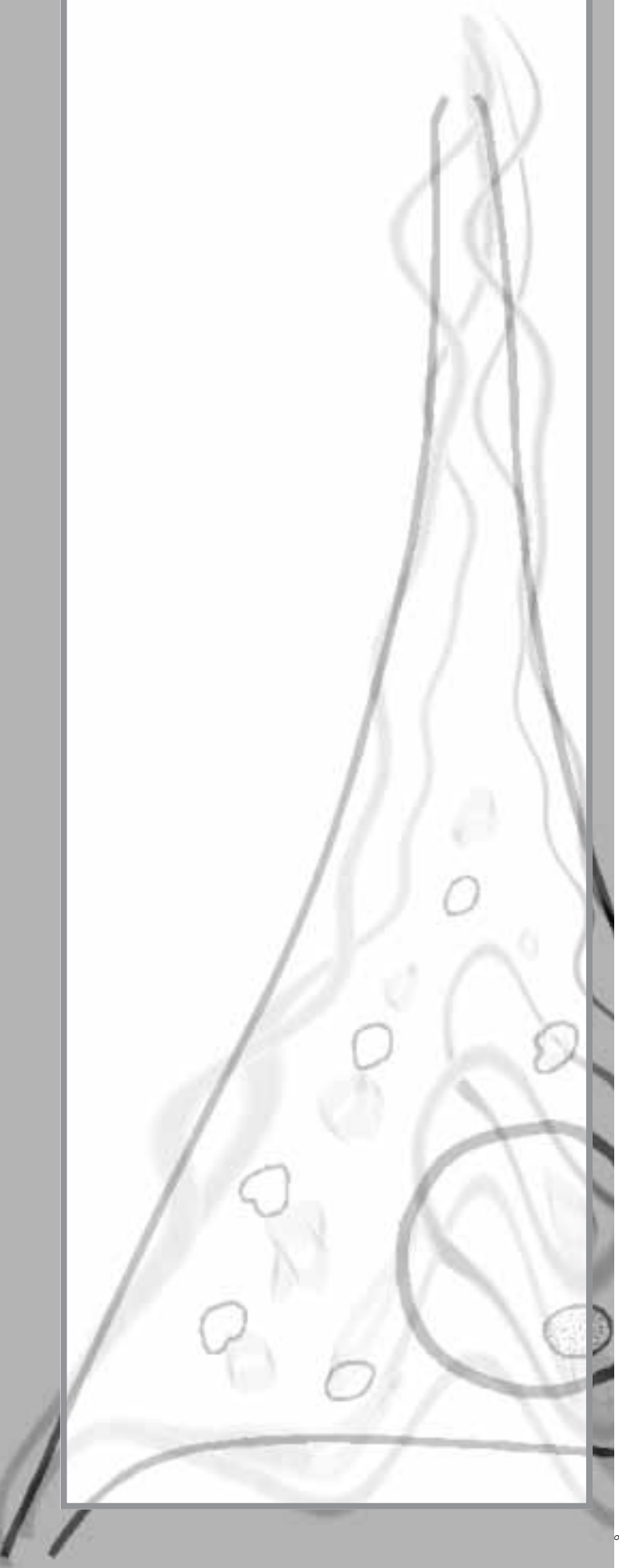
Please order from your local bookseller



CONTENTS AND CONTR

VOLUME ONE

Part I. Introduction and General Principles

1. Pathophysiology of nervous system diseases *Justin C. McArthur , Guy M. McKhann, W. Ian McDonald, Peter J. Goadsby and Arthur K. Asbury*
2. Genetics of common neurological disorders *Orest Hurko*
3. Repeat expansion and neurological disease *J. Paul Taylor, Andrew P. Lieberman and Kenneth H. Fischbeck*
4. Cell birth and cell death in the central nervous system *Samuel J. Pleasure and David E. Pleasure*
5. Neuroprotection in cerebral ischemia *Jin Moo Lee and Dennis W. Choi*
6. Promoting recovery of neurological function *Ted Abel and Michael E. Selzer*
7. Measurement of neurological outcomes *Jeremy Hobart and Alan J. Thompson*
8. Principles of clinical neuro-epidemiology *Michael D. Hill and Thomas E. Feasby*
9. Principles of therapeutics *Peter J. Goadsby*
10. Windows on the working brain: functional imaging *John A. Detre and Paul D. Acton*
11. Windows on the working brain magnetic resonance spectroscopy *James W. Prichard, Jeffrey R. Alger, Douglas Arnold, Ognen A. C. Petroff and Douglas L. Rothman*
12. Windows on the working brain: evoked potentials, magnetoencephalography and depth recording *Hans-Joachim Freund and H. J. Heinze*

Part II. Disorders of Higher Function

13. Congenital disorders of cerebral cortical development *Ganeshwaran H. Mochida and Christopher A. Walsh*
14. The aging brain: morphology, imaging and function *Guy M. McKhann and Marilyn S. Albert*
15. Neurodegenerative diseases *Stanley B. Prusiner*
16. Aging and dementia: principles, evaluation and diagnosis *Sudha Seshadri and David A. Drachman*
17. Alzheimer's disease *Raymond J. Kelleher and John H. Growdon*
18. Dementia with Lewy bodies *Pamela J. McLean, Estrella Gómez-Tortosa, Michael C. Irizarry and Bradley T. Hyman*
19. Frontotemporal dementia *Bruce L. Miller, Howard J. Rosen and Michael Greicius*
20. Consciousness and its disorders *Antonio R. Damasio*
21. Mechanisms of memory and amnestic syndromes *John Gabrieli and Silvia A. Bunge*
22. Acquired disorders of language *John Hart and Ola A. Selnes*
23. Neglect *Kenneth M. Heilman*
24. Brain death *James L. Bernat*
25. Disorders of mood *Dean F. MacKinnon and J. Raymond DePaulo*
26. Schizophrenia *Paul J. Harrison*
27. Obsessive-compulsive disorder *Bavanisha Vythilingum, Dan J. Stein and Scott L. Rauch*
28. Autism and austistic spectrum disorders *Barry Gordon*
29. Attention deficit hyperactivity disorder: spectrum and mechanisms *Martha Bridge Denckla*
30. The neurobiology of drug addiction *Charles A. Dackis and Charles P. O'Brien*

Part III. Disorders of Motor Control

31. Mechanisms of motor control *James Ashe and Apostolos P. Georgopoulos*
32. The apraxias *Ramón Carlos Leiguarda*
33. Parkinson's disease *Marian L. Evatt, Mahlon R. DeLong and Jerrold L. Vitek*
34. Other extrapyramidal syndromes *Kailesh P. Bhatia*
35. Tremors *Jyh-Gong Hou and Joseph Jankovic*
36. Myoclonus *Paul W. Brown*
37. Dystonia *Barbara Illowsky Karp, Susanne Goldstein and Mark Hallett*
38. Tourette syndrome *Donna J. Stephenson and Harvey S. Singer*
39. Cerebral palsy *Alexander H. Hoon and Michael V. Johnston*
40. Gait and balance disorders *John G. Nutt and Fay B. Horak*

Part IV. Disorders of the Special Senses

41. Smell *Richard L. Doty and Steven M. Bromley*
42. Taste *Steven M. Bromley and Richard L. Doty*
43. Disorders of vision *Anthony Morland and Christopher Kennard*
44. Oculomotor control: normal and abnormal *David S. Zee and R. John Leigh*
45. Hearing *Linda Luxon*
46. Vertigo and vestibular disorders *Thomas Brandt*

IBUTORS

Part V. Disorders of Spine and Spinal Cord
47. Spinal cord injury and repair *John W. McDonald*
48. Myelopathies *Phillip D. Thompson and Peter C. Blumbergs*
49. Diseases of the vertebral column *Simon F. Farmer and Lucinda J. Carr*
50. Cervical pain *Nikolai Bogduk*
51. Diagnosis and management of low back pain *Donlin M. Long and Mohammed BenDebba*

Part VI. Disorders of Body Function
52. Autonomic function and dysfunction *Christopher J. Mathias*
53. Human brain-gut interactions: mechanisms of swallowing, visceral perception and anal continence in health and disease *Shaheen Hamdy*
54. Eating disorders: neurobiology and symptomatology *David C. Jimerson and Barbara E. Wolfe*
55.Sleep and its disorders *Robert Y. Moore and Eric A. Nofzinger*
56. Bladder and sexual dysfunction *Oliver J. Wiseman and Clare J. Fowler*
57. Hypothalamic/pituitary function and dysfunction *Roberto Salvatori and Gary Wand*

Part VII. Headache and Pain
58. Peripheral nociception and the genesis of persistent clinical pain *Richard J. Mannion and Clifford J. Woolf*
59. Central nervous system mechanisms of pain *Fred A. Lenz, Patrick M. Dougherty and Joe D. Greenspan*
60. Management of chronic pain *Russell K. Portenoy and August Caraceni*
61. Migraine *Michel D. Ferrari and Joost Haan*
62. Cluster headache, other trigeminal autonomic syndromes and the short-lived headaches *Peter J. Goadsby*
63. Orofacial pain *Steven B. Graff-Radford*
64. Chronic daily headache *Stephen D. Silberstein and Richard B. Lipton*

VOLUME TWO

Part VIII. Neuromuscular Disorders
65. Pathophysiology of nerve and root disorders *Jonathan D. Glass*
66. Toxic and metabolic neuropathies *Shawn J. Bird and Arthur K. Asbury*
67. Guillain Barré syndrome *John D. Pollard and Judith M. Spies*
68. Hereditary neuropathies *Mary Reilly and Peter K. Thomas*
69. Disorders of neuromuscular junction transmission *Vinay Chaudhry and Daniel B. Drachman*
70. Disorders of striated muscle *Richard W. Orrell and Robert C. Griggs*
71. Pathophysiology of myotonia and periodic paralysis *Stephen C. Cannon and Alfred L. George, Jr.*
72. Pathophysiology of metabolic myopathies *Salvatore DiMauro and Ronald G. Haller*

Part IX. Epilepsy
73. The cellular basis of epilepsy *Robert S. Fisher and Jie Wu*
74. Clinical spectrum of epilepsy *Renzo Guerrini, Lucio Parmeggiani and Pierre Thomas*
75. Status epilepticus *Hannah Cook and Simon Shorvon*
76. Assessment of the patient with epilepsy *John Duncan*
77. Principles of pharmacotherapy of the epilepsies *Emilio Perucca*
78. Epilepsy surgery: disease treatment and investigative opportunity *Guy M. McKhann and Matthew Howard*

Part X. Cerebrovascular Disorders
79. Physiology of the cerebral circulation *Peter J. Goadsby and Richard P. White*
80. Stroke syndromes *Louis R. Caplan*
81. The treatment of acute ischemic stroke *Robert A. Felberg and James C. Grotta*
82. Behavioral manifestations of stroke *Richardo E. Jorge and Robert G. Robinson*
83. Intracerebral hemorrhage *Juan R. Carhuapoma and Daniel F. Hanley*
84. Aneurysms and arteriovenous malformations *Marcus A. Stoodley and Bryce K. A. Weir*
85. Hereditary causes of stroke *Martin Dichgans*
86. Prevention management of stroke *Gillian E. Mead and Charles P. Warlow*

Part XI. Neoplastic Disorders
87. Primary brain tumors in adults *John Laterra and Henry Brem*
88. Brain tumors in children *Peter C. Phillips and Michael A. Grotzer*
89. Brain metastases *Roy A. Patchell*
90. Paraneoplastic syndromes *Jerome B. Posner*
91. Harmful radiation on the nervous system *Jeremy H. Rees and Michael Brada*

Part XII. Autoimmune Disorders
92. Immune mechanisms in neurological disease *Hans-Peter Hartung, Klaus V. Toyka and Bernd C. Kieseier*
93. The basis of immunotherapy in neurological disease *Reinhard Hohlfeld*
94. Vascullitis of the nervous system *David Hellman and John H. Stone*
95. Sarcoidosis of the nervous system *John Zajicek*
96. Collagen-vascular disease and the nervous system *Michael J. Regan and John H. Stone*

Part XIII. Disorders of Myelin
97. Myelination, demyelination and remyelination *Alastair Compston*
98. Multiple sclerosis and its pathophysiology *W. Ian McDonald, Maria A. Ron and Gavin Giovannoni*
99. The diagnosis and management of multiple sclerosis *David Miller and Alan J. Thompson*
100. Leucodystrophies *Hugo Moser and Kunihiko Suzuki*

Part XIV. Infections
101. Host responses in central nervous system infection *David N. Irani and Diane E. Griffin*
102. Viral diseases of the nervous system *Larry E. Davis*
103. Neurological manifestations of HIV infection *Justin C. McArthur*
104. Neurological manifestations of HTLV-I infection *Mitsuhiro Osame*
105. Clinical features of human prion diseases *Robert Will*
106. Bacterial infections *Dakshin Gullapalli and Thomas P. Bleck*
107. Parasitic disease *Julio Sotelo and Kaethe Willms*
108. Lyme disease *Patricia K. Coyle*
109. Neurosyphilis *Louis Reik, Jr*
110. Tuberculosis *Yukari C. Manabe and Richard Chaisson*

Part XV. Trauma and Toxic Disorders
111. Head trauma *M. Sean Grady and Tracy K. McIntosh*
112. Environmental toxins and neurological disease *Jennifer B. Sass, D. Merglet and Ellen K. Silbergeld*
113. Alcohol neurotoxicity *Ivan F. Diamond and Steven L McIntire*
114. Neurological consequences of drug abuse *John C. M. Brust*

Part XVI. Degenerative Disorders
115. Genetically engineered models of neurodegenerative diseases *Philip C. Wong, Huaibin Cai, David R. Borchelt and Donald L. Price*
116. Motor neurone disease *Pamela J. Shaw*
117. The hereditary ataxias *Puneet Opal and Huda Y. Zoghbi*
118. Huntington's disease *Christopher Ross and Russell L. Margolis*
119. Progressive cerebral degeneration of childhood *Gerald V. Raymond*
120. Mitochondrial encephalony opathies *Anthony H. V. Schapira and Salvatore DiMauro*

Part XVII. Neurological Manifestations of Systemic Conditions
121. Neurological aspects of pregnancy *Peter W. Kaplan*
122. The brain and the cardiovascular system *James L. Januzzi and Guy M. McKhann*
123. Neurological complications of hepatic disease and gastrointestinal disease *Benjamin H. Eidelman*
124. Renal disease and electrolyte disturbances *G. Bryan Young and Charles F. Bolton*
125. Disorders of intracranial pressure *Romergryko G. Geocardin and Michael A. Williams*
126. Neurologic manifestations of endocrine disease *Gary M. Abrams and Cheryl A. Jay*
127. Neurological manifestations of hematological diseases *Martin A. Samuels*
128. Neurocutaneous syndromes *E. Steve Roach*
129. Neurological complications after organ transplantation *Eelco F. M. Wijdicks.*

ISBN 0-521-91070-6

9 780521 910705 >

CAMBRIDGE UNIVERSITY PRESS
www.cambridge.org

Printed in the United Kingdom at the University Press, Cambridge August 2002

New Edition

Special Introductory Offer
see inside for details

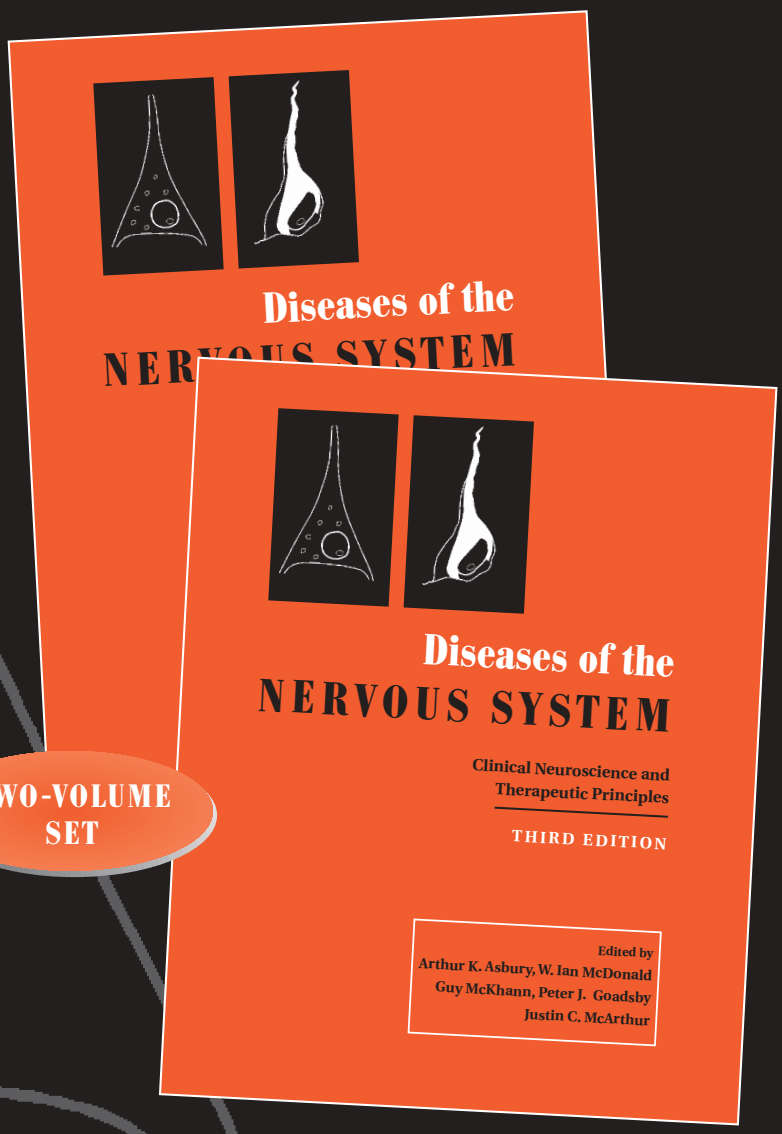
Diseases of the NERVOUS SYSTEM

Clinical Neuroscience and Therapeutic Principles

THIRD EDITION

'A scholarly, well-crafted and attractive book ... deserves a place in the library of every medical school, neurology department, and neuroscience department'

- New England Journal of Medicine



TWO-VOLUME SET

CAMBRIDGE
UNIVERSITY PRESS

Diseases of the NERVOUS SYST

Clinical Neuroscience and T

THIRD EDITION

Edited by:

Arthur Asbury
Department of Neurology, University of Pennsylvania School of Medicine, Philadelphia, USA

Guy Mckhann
The Zanvyl Krieger Mind and Brain Institute, Johns Hopkins University School of Medicine, Baltimore, USA

Ian McDonald
Institute of Neurology, University College London, Royal College of Physicians, London, UK

Peter Goadsby
Institute of Neurology, The National Hospital for Neurology and Neurosurgery, London, UK

Justin McArthur
Departments of Neurology and Epidemiology, Johns Hopkins University School of Medicine, Baltimore, USA

Presenting the third edition of a neurolo

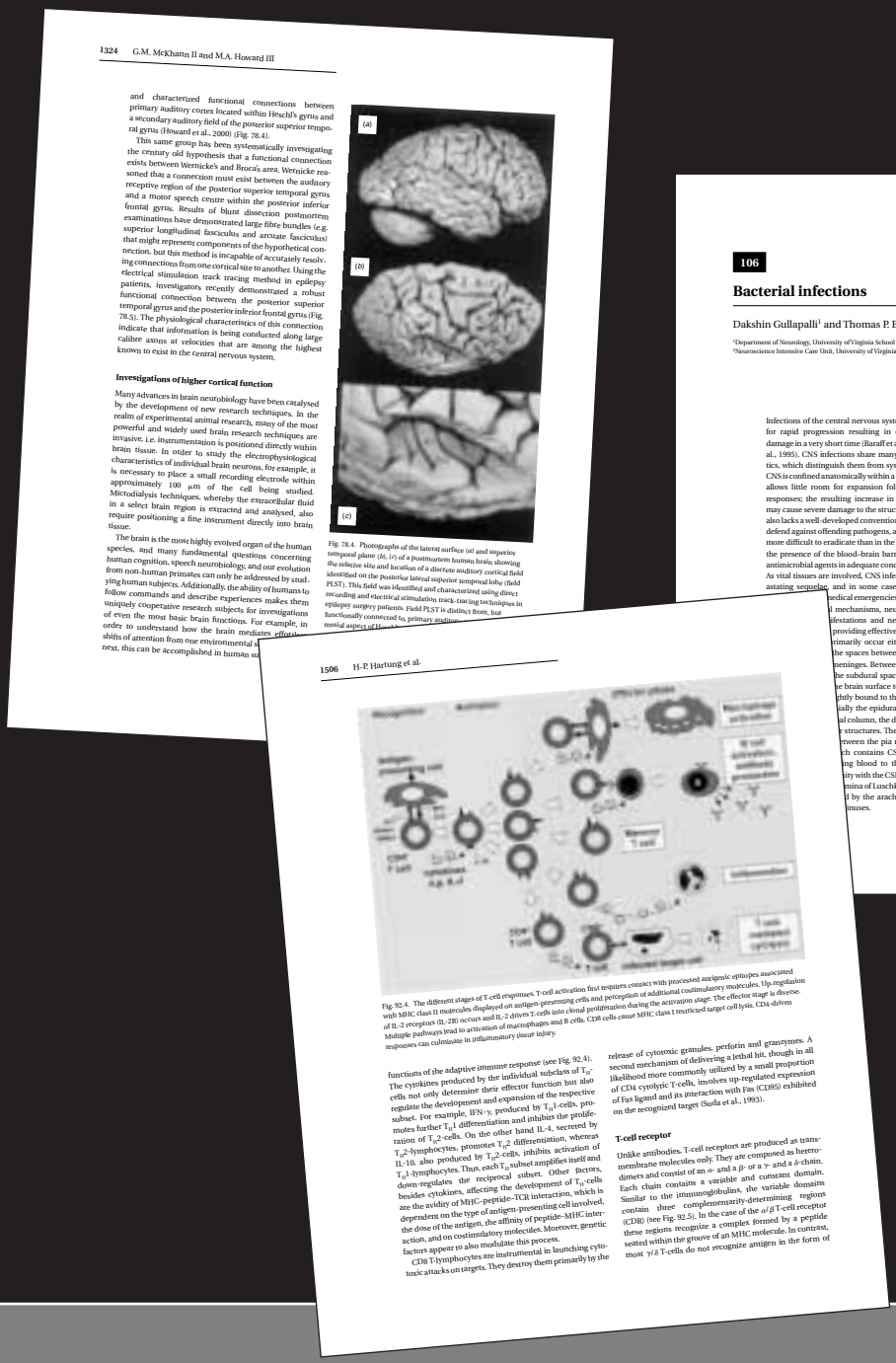
The most comprehensive, up-to-date, reference on dis nervous system currently available. Now in its third ed two-volume text is packed with details on the clinical neurological disorders with a focus on the underlying that lead to these disorders – pathology, pathophysiol and cellular dysfunction.

These underlying mechanisms form the basis for the m therapeutic principles that are emphasized throughou issues of diagnosis, pharmacotherapy, and manageme detail – to better serve the needs of today's busy clinici

Generously illustrated with diagrams, tables, clinical p scans (MRI, fMRI, MRS, SPECT etc..), each volume also colour plate section – all designed to enhance the reade of the material being presented.

Take advantage of the special introductory offer and re today!

The most comprehensive neu



1324 G.M. McKhann II and M.A. Howard III

and characterized functional connections between primary auditory cortex located within Heschl's gyrus and a secondary auditory field of the posterior superior temporal gyrus (Howard et al., 2000) (Fig. 78.4).

This same group has been systematically investigating the century old hypothesis that a functional connection exists between Wernicke's and Broca's area. Wernicke reasoned that a connection must exist between the auditory receptive region of the posterior superior temporal gyrus and a motor speech centre within the posterior inferior frontal gyrus. Results of blunt dissection postmortem examinations have demonstrated large fibre bundles (e.g. superior longitudinal fasciculus and arcuate fasciculus) that might represent components of the hypothetical connection, but this method is incapable of accurately resolving connections from one cortical site to another. Using the electrical stimulation track tracing method in epilepsy patients, investigators recently demonstrated a robust functional connection between the posterior superior temporal gyrus and the posterior inferior frontal gyrus (Fig. 78.5). The physiological characteristics of this connection indicate that information is being conducted along large calibre axons at velocities that are among the highest known to exist in the central nervous system.

Investigations of higher cortical function

Many advances in brain neurobiology have been catalysed by the development of new research techniques. In the realm of experimental animal research, many of the most powerful and widely used brain research techniques are invasive, i.e. instrumentation is positioned directly within brain tissue. In order to study the electrophysiological characteristics of individual brain neurons, for example, it is necessary to place a small recording electrode within approximately 100 μm of the cell being studied. Microdialysis techniques, whereby the extracellular fluid in a select brain region is extracted and analysed, also require positioning a fine instrument directly into brain tissue.

The brain is the most highly evolved organ of the human species, and many fundamental questions concerning human cognition, speech neurobiology, and our evolution from non-human primates can only be addressed by studying human subjects. Additionally, the ability of humans to follow commands and describe experiences makes them uniquely cooperative research subjects for investigations of even the most basic brain functions. For example, in order to understand how the brain mediates efficient shifts of attention from one environmental s... next, this can be accomplished in human su...

(a) (b) (c)

Fig. 78.4. Photographs of the lateral surface (*a*) and superior temporal plane (*b*, *c*) of a postmortem human brain showing the relative site and location of a discrete auditory cortical field identified on the posterior lateral superior temporal lobe (field PLST). This field was identified and characterized using direct recording and electrical stimulation track-tracing techniques in epilepsy surgery patients. Field PLST is distinct from, but functionally connected to, primary auditor... mesial aspect of H...

106

Bacterial infections

Dakshin Gullapalli[1] and Thomas P. Bleck[2]

[1]Department of Neurology, University of Virginia School of Medicine, Charlottesville, VA, USA
[2]Neuroscience Intensive Care Unit, University of Virginia School of Medicine, Charlottesville, VA, USA

Infections of the central nervous system (CNS) are notable for rapid progression resulting in death or permanent damage in a very short time (Baraff et al., 1993; Grimwood et al., 1995). CNS infections share many distinct characteristics, which distinguish them from systemic infections. The CNS is confined anatomically within a bony casement which allows little room for expansion following inflammatory responses; the resulting increase in intracranial pressure may cause severe damage to the structures within. The CNS also lacks a well-developed conventional immune system to defend against offending pathogens, and thus infections are more difficult to eradicate than in the periphery. Because of the presence of the blood–brain barrier (BBB), delivery of antimicrobial agents in adequate concentrations is difficult. As vital tissues are involved, CNS infections can cause devastating sequelae, and in some cases may result in both ...edical emergencies. Understanding their ...l mechanisms, neuroanatomical princi... ...festations and neuroradiological fea... providing effective treatment.

...rimarily occur either within the brain ...he spaces between the different layers ...eninges. Between the dura mater and ...he subdural space, through which the ...e brain surface to the venous sinuses. ...ghtly bound to the inner table of skull, ...ally the epidural space is a potential ...al column, the dura is separated from ... structures. The subarachnoid space ...tween the pia mater and the arach... ...ch contains CSF and the medium... ...ng blood to the brain. CSF in the ...ity with the CSF in the subarachnoid ...mina of Luschka and Magendie. The ...d by the arachnoid granulations to ...inuses.

Bacterial meningitis

Bacterial meningitis is an inflammatory response to infection of the pia–arachnoid and the CSF of the subarachnoid space. Since the subarachnoid space is continuous throughout the neuraxis, this inflammation extends throughout the subarachnoid space as well as ventricles. When there is accompanying obvious brain involvement, it is more appropriately called meningoencephalitis. Histologically, most meningitides include some parenchymal involvement, but when clinical signs of meningeal inflammation predominate one traditionally refers to the condition as meningitis. Knowledge of the anatomic details and CSF flow pathways is important to understand the pathophysiologic manifestations.

Historical background

Meningitis was first described in detail by Gaspard Vieusseux as malignant purpuric fever in 1805 following an outbreak in Switzerland. Following the introduction of lumbar puncture in 1891 by Quinke, the CSF changes associated with meningitis were recognized, and attempts made at treatment with CSF drainage and irrigation with a variety of fluids. Survival from bacterial meningitis improved following the development of horse antimeningococcal antiserum and its intrathecal and systemic administration by Simon Flexner during the first world war. However, a much more substantial impact on outcome followed the advent of antimicrobial therapy. Although sulfonamides were discovered in 1908, their antibiotic potential was not appreciated until 1932 with the discovery of sulfachrysoidine (Prontosil). The subsequent isolation of penicillin by Howard Florey in 1941 further improved survival from bacterial meningitis. Though the techniques of its administration and dosage

1506 H.-P. Hartung et al.

Fig. 92.4. The different stages of T-cell responses. T-cell activation first requires contact with processed antigenic epitopes associated with MHC class II molecules displayed on antigen-presenting cells and perception of additional costimulatory molecules. Up-regulation of IL-2 receptors (IL-2R) occurs and IL-2 drives T-cells into clonal proliferation during the activation stage. The effector stage is diverse. Multiple pathways lead to activation of macrophages and B cells. $CD8^+$ cells cause MHC class I restricted target cell lysis. $CD4^+$-driven responses can culminate in inflammatory tissue injury.

functions of the adaptive immune response (see Fig. 92.4). The cytokines produced by the individual subclass of T_H^+ cells not only determine their effector function but also regulate the development and expansion of the respective subset. For example, IFN-γ, produced by T_H1-cells, promotes further T_H1 differentiation and inhibits the proliferation of T_H2-cells. On the other hand IL-4, secreted by T_H2-lymphocytes, promotes T_H2 differentiation, whereas IL-10, also produced by T_H2-cells, inhibits activation of T_H1-lymphocytes. Thus, each T_H subset amplifies itself and down-regulates the reciprocal subset. Other factors, besides cytokines, affecting the development of T_H-cells are the avidity of MHC–peptide–TCR interaction, which is dependent on the type of antigen-presenting cell involved, the dose of the antigen, the affinity of peptide–MHC interaction, and on costimulatory molecules. Moreover, genetic factors appear to also modulate this process.

$CD8^+$ T-lymphocytes are instrumental in launching cytotoxic attacks on targets. They destroy them primarily by the release of cytotoxic granules, perforin and granzymes. A second mechanism of delivering a lethal hit, though in all likelihood more commonly utilized by a small proportion of $CD4^+$ cytolytic T-cells, involves up-regulated expression of Fas ligand and its interaction with Fas (CD95) exhibited on the recognized target (Suda et al., 1993).

T-cell receptor

Unlike antibodies, T-cell receptors are produced as transmembrane molecules only. They are composed as heterodimers and consist of an α- and a β- or a γ- and a δ-chain. Each chain contains a variable and constant domain. Similar to the immunoglobulins, the variable domains contain three complementarity-determining regions (CDR) (see Fig. 92.5). In the case of the α/β T-cell receptor these regions recognize a complex formed by a peptide seated within the groove of an MHC molecule. In contrast, most γ/δ T-cells do not recognize antigen in the form of

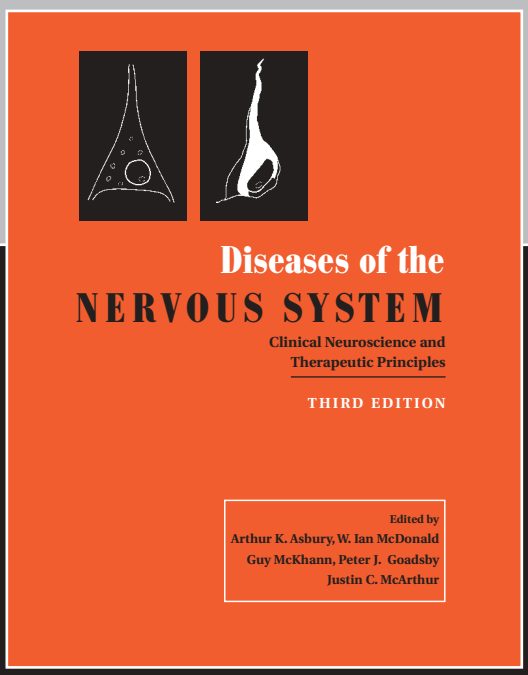
Reviews of previous editions:

'This is a superb book'

- Journal of Neurology, Neurosurgery and Psychiatry

'All clinical neurologists and trainees in neurology will find it invaluable as a reference and a way into the latest scientific literature'

- British Medical Journal



Features:

- **Third edition of a neurology classic – the most comprehensive, scientific account of clinical neurology**
- **Fully revised and updated with greater emphasis on therapeutic principles**
- **Reviews the underlying mechanisms that lead to neurological dysfunction**
- **Well-illustrated with 200 line drawings, 200 half-tones, 25 colour plates, and 350 tables**

Current, comprehensive and authoritative, this is the definitive reference for neurologists, neurosurgeons, neuropsychiatrists, and psychiatrists, indeed everyone with a professional or research interest in the neurosciences.

For full list of contents with contributors see over page