



# BIOELECTROMAGNETIC MEDICINE



Edited by PAUL J. ROSCH, M.D. *The American Institute of Stress, Yonkers, New York, U.S.A., and New York Medical College, Valhalla, New York, U.S.A.*; and MARKO S. MARKOV, Ph.D. *Research International, Buffalo, New York, U.S.A.*

April 2004 / 864 pp. / ISBN: 0-8247-4700-3 / E-ISBN: 0-8247-5717-3 / List Price: \$195.00 / Special Offer: \$156.00

**The only comprehensive resource that reviews clinical applications of evidence-based bioelectromagnetic therapies for disorders ranging from cancer, coronary disease, and obesity to neuropsychiatric disturbances, including Parkinson's disease; epilepsy; multiple sclerosis; tinnitus; macular degeneration; migraine; musculoskeletal pain syndromes; depression; insomnia; and anxiety.**

## **Bioelectromagnetic Medicine**

- thoroughly explains the biologic effects of magnetic and electromagnetic fields and the importance of dosimetry in determining clinical efficacy and safety
- presents examples of cutting-edge breakthroughs supported not only by rigid clinical trials but also by solid basic science research
- identifies promising new approaches based on research advances in the U.S., Europe, Eastern Europe, Russia, and Pacific Rim countries

## CONTENTS

### PREFACE

### INTRODUCTION

**Potential Therapeutic Applications of Nonthermal Electromagnetic Fields: Ensemble Organization of Cells in Tissue as a Factor in Biological Field Sensing**  
*W. Ross Adey*

**Signal Shapes in Electromagnetic Therapies: A Primer** *A. R. Liboff*

**Magnetic Field Generation and Dosimetry** *Stefan Engström*

**Image-Guided Electromagnetic Therapy** *Frank S. Prato*

### THE EVOLUTION OF BIOELECTROMAGNETIC THERAPIES

**The Theology of Electricity**  
*Dennis Stillings*

**Recent Developments in Bioelectromagnetic Medicine**  
*James L. Oschman*

**Evolution of Electrotherapy: From TENS to Cyberpharmacology**  
*C. Norman Shealy, Saul Liss, and Bernard S. Liss*

**Origin and Evolution of Vagal Nerve Stimulation: Implications for Understanding Brain Electrodynamics, Neuroendocrine Function, and Clinical Applications** *Jacob Zabara*

**Chronic Therapeutic Brain Stimulation: History, Current Clinical Indications, and Future Prospects** *Alon Y. Mogilner, Alim-Louis Benabid, and Ali R. Rezai*

### MECHANISMS OF ACTION AND THEORETICAL CONSIDERATIONS

**Quantum Holography: A Basis for the Interface Between Mind and Matter** *Edgar Mitchell*

**Subtle Energies and Their Roles in Bioelectromagnetic Phenomena**  
*William A. Tiller*

**Electromagnetism versus Bioelectromagnetism**  
*William A. Tiller*

**A Fundamental Basis for the Effects of EMFs in Biology and Medicine: The Interface Between Matter and Function**  
*J. Benveniste*

**Electromagnetic Techniques in Neural Therapy** *K. A. Jenrow and A. R. Liboff*

**Is There an Electrical Circulatory System that Communicates Internally and Externally?** *Paul J. Rosch and Björn E. W. Nordenström*

### NEUROLOGIC, MUSCULOSKELETAL AND SOFT TISSUE APPLICATIONS

**Magnetic and Electromagnetic Field Therapy: Basic Principles of Application for Pain Relief**  
*Marko S. Markov*

**Deep Brain Stimulation for Parkinson's Disease and Movement Disorders** *E. Oscar Richter and Andres M. Lozano*

**Noninvasive Pulsed Electromagnetic Therapy for Migraine and Multiple Sclerosis**  
*Martha S. Lappin*

**Repetitive Transcranial Magnetic Stimulation (rTMS) for Depression and Other Indications** *Mark S. George, Ziad Nahas, F. Andrew Kozel, Xingbao Li, K. Yamanaka, A. Mishory, and Daryl E. Bohning*

**Repetitive Transcranial Magnetic Stimulation for Tinnitus**  
*Paul J. Rosch*

**Low-Energy Emission Therapy (LEET): Current Status and Future Directions** *Boris Pasche and A. Barbault*

**Vagus Nerve Stimulation for the Treatment of Epilepsy**  
*Steven C. Schachter*

—Continued from front—

**Electrical Stimulation of the Internal Globus Pallidus in Advanced Generalized Dystonia**

*Laura Cif, N. Vayssiere, S. Hemm, M. Azais, C. Monnier, E. Hardouin, A. Gannau, M. I. Zanca, and Philippe Coubes*

**Peripheral Stimulation for Pain Control and the Development of Modern Transcutaneous Stimulation for Pain**

*Donlin M. Long and Norman Hagfors*

**Low-Frequency Electromagnetic Field Effects on Lymphocytes: Potential for Treatment of Inflammatory Diseases**

*Gabi Nindl, Mary T. Johnson, and Walter X. Balcavage*

**Orthopedic Clinical Application of Biophysical Stimulation in Europe**

*Ruggero Cadossi and Gian Carlo Traina*

**Electromagnetic Stimulation in Orthopedics: Biochemical Mechanisms to Clinical Applications**

*James T. Ryaby*

**Application of Electromagnetic Fields in Traumatology and Orthopedics**

*Imants Detlavs*

**Neurorehabilitation of Standing and Walking After Spinal Cord Injury**

*Tadej Bajd*

**Electromagnetic Linkages in Soft Tissue Wound Healing**

*Harvey N. Mayrovitz*

**Electrical Wound Healing**

*David Cukjati and Rajmond Savrin*

**Pulsed Magnetic Therapy for the Treatment of Incontinence, Disuse Atrophy, Muscle Spasm, and Muscle Reeducation to Increase Mobility**

*Kent Davey*

**Coblation Radiofrequency Discal Nucleoplasty: A Novel Approach to the Management of Acute Disc Herniation**

*Arra S. Reddy and Joshua A. Hirsch*

**CARDIOVASCULAR DISORDERS AND CANCER**

**Electricity and the Heart: Innovation and the Evolution of Cardiac Pacing**

*Kirk Jeffrey*

**The Energetic Heart: Biomagnetic Communication Within and Between People**

*Rollin McCraty*

**Static Magnetic Fields and Microcirculation**

*C. Ohkubo and H. Okano*

**Magneto-Metabolic Therapy for Advanced Malignancy and Cardiomyopathy**

*Demetrio Sodi Pallares and Paul J. Rosch*

**Electromagnetic Fields as an Adjuvant Therapy to Antineoplastic Chemotherapy**

*Joseph R. Salvatore and Marko S. Markov*

**Can Magnetic Fields Inhibit Angiogenesis and Tumor Growth?**

*Marko S. Markov, Calvin D. Williams, Ivan L. Cameron, W. Elaine Hardman, and Joseph R. Salvatore*

**Electroporation for Electrochemotherapy and Gene Therapy**

*Damijan Miklavcic and Tadej Kotnik*

**Electroporation Therapy: Treatment of Cancer and Other Therapeutic Applications**

*Dietmar Rabussay, Georg Widera, and Martin Burian*

**The Paradigm of Biologically Closed Electrical Circuits and Its Clinical Applications**

*Björn E. W. Nordenström and Jorgen Nordenström*

**Electrochemical Therapy of Tumors**

*Yuling Xin, Hengchan Zhao, Wei Zhang, Chaoyang Liang, Zaiyeng Wang, and Ganzhong Liu*

**CRANIOELECTRICAL STIMULATION AND OTHER INDICATIONS**

**Cranial Electrotherapy Stimulation for Anxiety, Depression, Insomnia, Cognitive Dysfunction, and Pain**

*Daniel L. Kirsch and Ray B. Smith*

**Low-Intensity Millimeter Waves in Biology and Medicine**

*O. V. Betskii and N. N. Lebedeva*

**The Use of Electrical Stimulation to Treat Morbid Obesity**

*Mitchell Roslin and Marina Kurian*

**BioCurrent Therapy for Macular Degeneration**

*John B. Jarding and George D. O'Clock*

**PERMANENT MAGNET APPLICATIONS**

**Clinical Trials Involving Static Magnetic Field Applications**

*Agatha P. Colbert*

**Pain-Free and Mobility-Free Magnetic Force in Orthodontic Therapy**

*A. M. Blechman*

**CONCLUSION**

**Concluding Comments**

*Paul J. Rosch and Marko S. Markov*

**INDEX**

