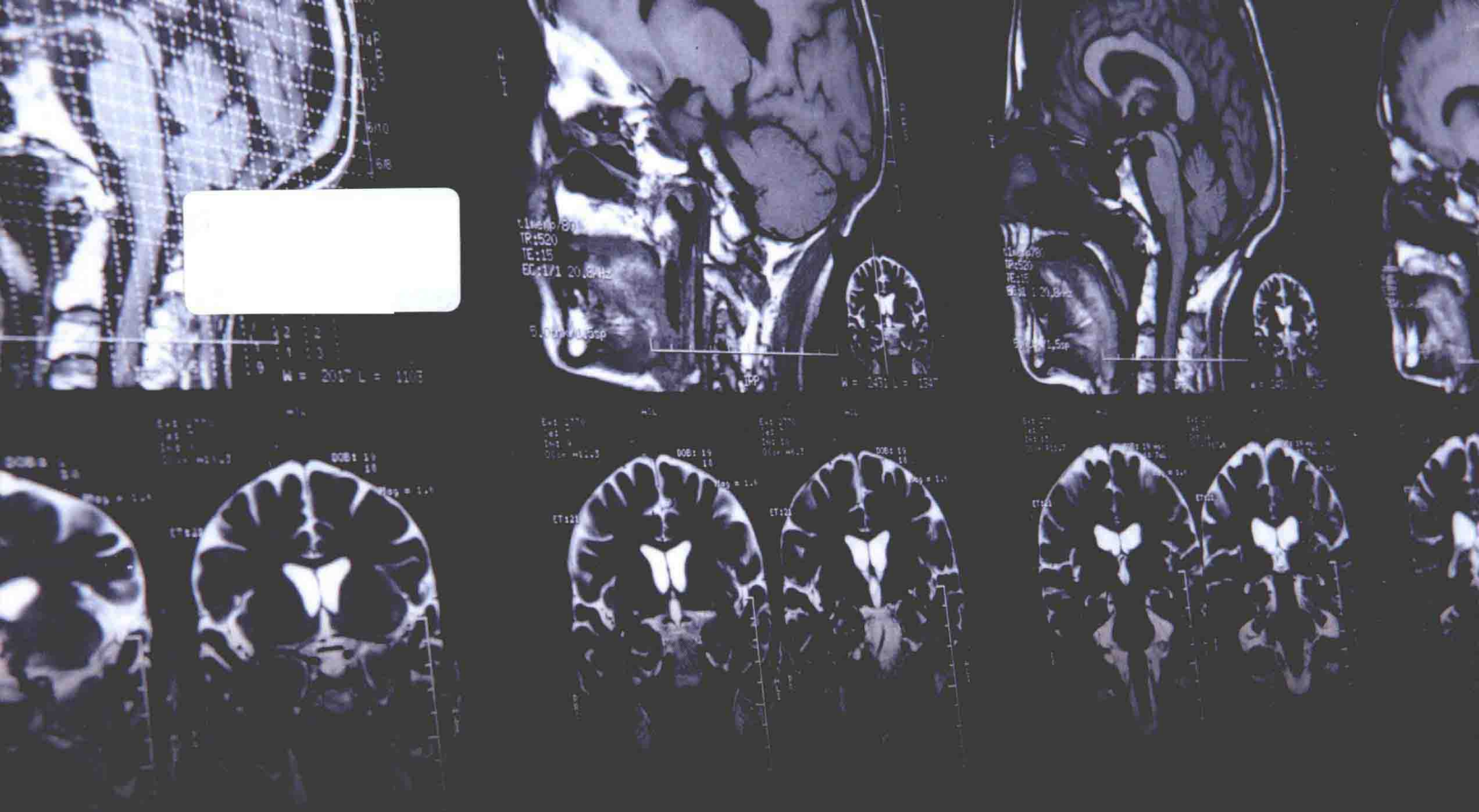

Bioactive Nutraceuticals and Dietary Supplements in Neurological and Brain Disease

Prevention and Therapy

Edited by
Ronald Ross Watson
Victor R. Preedy

BIOACTIVE NUTRACEUTICALS AND DIETARY SUPPLEMENTS IN NEUROLOGICAL AND BRAIN DISEASE

PREVENTION AND THERAPY

Edited by

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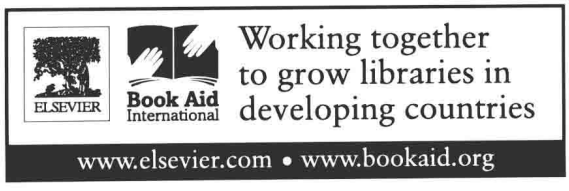

BIOACTIVE NUTRACEUTICALS AND DIETARY SUPPLEMENTS IN NEUROLOGICAL AND BRAIN DISEASE

PREVENTION AND THERAPY

Preface

With the increasing age of populations in developed countries comes the ability to identify, and a greater prevalence of, neurological problems. The primary goal of this book is to have experts review foods, nutraceuticals, and dietary supplements that may modulate brain and neurological functions and analyze the existing published evidence. First, the actions of complementary and alternative supplements are reviewed for actions and neurological targets. Isolated products, including lutein, nutrients in general, vitamin E, and polyphenols, are reviewed for actions on the brain and neurotrophic growth factors. Several reviews summarize the anti-inflammatory actions of supplements, including saffron and several polyphenols. For example, Panickar describes the anti-inflammatory actions of several botanical extracts to protect from cerebral ischemia. Polyphenols are particularly interesting, with their great variety and sources in common foods. Das shows that they have antiamyloid properties in the treatment of Alzheimer's disease. Brimson reviews the neuroprotectants isolated from *Rhinacanthus*.

Next, the role of various supplements in the prevention and treatment of neurodegenerative diseases is summarized by many experts. Neuropathic pain can be revised by dietary supplements and functional foods, according to da Silva, and by Ginkgo, as reviewed by Cankaya. In addition, polyphenols modulate brain aging and diseases as well as insomnia. Simple nutrient supplements modulate Ehlers-Danlos syndrome, and another review describes the evidence that trace element deficiencies induce neurological disease and that their supplementation helps in treatment of the condition.

In the third section, nutraceuticals as interventions are reviewed for mood and cognition. Sharma describes the Indian Ayurvedic approach to neurological health. Schauss reviews the food acai on brain performance. Marilu describes chili pepper compounds in the management of neuropathic pain, while Franceschi focuses on curcumin and neurological disorders.

The fourth section focuses on foods and drugs in neurodegenerative diseases, including some that induce toxicity. Roysommuti describes taurine exposure in the brain and neurological disorders. Carod Artal reviews diverse plants, seeds, and fruits that produce adverse neurological effects. Fretham summarizes the historically known role of mercury in neurodegeneration. Similarly, according to Luong, caffeine has neurodegenerative actions via genetic and cellular signaling mechanisms. Lui also describes molecular mechanisms of geniposide against Alzheimer's disease, while Arredondo reviewes flavones and flavonols in brain disease, both the positive and negative aspects. Finally, Gokul describes flavonoid-rich foods and their relevance to age-related neurodegeneration.

The fifth section describes dietary supplements in neurological disease therapy through their effects on autoimmunity and antioxidants. Watson summarizes the correlation between meat, fat, and fruit consumption and autoimmune neurological disease. Similarly, Cipollina and Schopfer indicate that electrophilic derivatives of omega-3 fatty acids can play a role in the prevention of neurodegenerative disorders. Tosun and Khan look at the effect of spices, while Sulman looks at the effect of ginsenosides in food supplements on age-related diseases. Antioxidants help treat multiple sclerosis, and Ngo reviews the effect of high-calorie foods on amyotrophic lateral sclerosis.

The sixth section focuses on hypertension and stroke as modified by food. Alfieri describes literature showing that bioactive materials affect stroke by activation of endogenous antioxidant pathways and mechanisms of neurovascular protection. Takahata reviews oral feeding for risks and benefits in patients with intracerebral hemorrhage. Schreihofer notes the role of isoflavones in cerebral ischemia, while vitamin E in stroke-prone rats preventing ischemia-induced neuronal apoptosis is discussed. Finally, Cheatwood summarizes the role of diets on stroke and traumatic brain injury.

The final section reviews the roles and possible effects on seizures, amyotrophic lateral sclerosis, and Parkinson's disease, which are frequently difficult to treat or manage, leading people to look for alternative therapies. Baroni and Mythri review the effects of different natural plant products on Parkinson's disease. Seizures and epilepsy are particularly challenging. Tan, Tyrlikova, and Messer each review aspects of ketogenic diets and novel metabolic treatment approaches. Finally, Pogge and Neyestami review the role of vitamin D in Alzheimer's disease and multiple sclerosis, respectively. In summary, the findings from our expert reviews demonstrate that a wide variety of unique biomolecules as well as common foods and nutrients can play important roles in the treatment of neurological diseases and functions.

About the Editors

Professor Victor R. Preedy, PhD, DSc, CBiol, FIBiol, FRCPath, FRIPH, FRSH, FRSPH, is currently a professor in the Department of Dietetics, King's College, London, an honorary professor in Clinical Biochemistry, King's College Hospital, and Director of the Genomics Centre, Kings College, London. He directs studies regarding nutrition and clinical biochemistry. Professor Preedy graduated in 1974 from the University of Aston with a combined honours degree in Biology and Physiology with Pharmacology. He gained his PhD in 1981 in the field of nutrition and metabolism from the London School of Hygiene and Tropical Medicine, University of London. Between 1988 and 1999, he was associated with the Department of Clinical Biochemistry at King's College Hospital. He was a reader in Clinical Biochemistry between 1992 and 2002. In 1992, he received his membership of the Royal College of Pathologists, based on his published works, and in 1993 he gained a DSc degree for his outstanding contribution to protein metabolism. At the time, he was one of the university's youngest recipients of this distinguished award. Professor Preedy was elected as a fellow to the Royal College of Pathologists in 2000. Since then, he has been elected as a fellow to the Royal Society for the Promotion of Health (2004), The Royal Institute of Public Health (2004), and The Royal Society of Public Health (2009). Professor Preedy has published over 550 articles, which include over 160 peer-reviewed manuscripts based on original research and 90 reviews, as well as 35 books or volumes.

Ronald R. Watson, PhD, attended the University of Idaho but graduated from Brigham Young University in Provo, Utah, with a degree in chemistry in 1966. He earned his PhD in Biochemistry from Michigan State University in 1971. His postdoctoral schooling in nutrition and microbiology was completed at the Harvard School of Public Health, where he gained two years of postdoctoral research experience in immunology and nutrition.

From 1973 to 1974, Dr. Watson was Assistant Professor of Immunology and performed research at the University of Mississippi Medical Center in Jackson. He was Assistant Professor of Microbiology and Immunology at the Indiana University Medical School from 1974 to 1978 and Associate Professor at Purdue University in the Department of Food and Nutrition from 1978 to 1982. In 1982, Dr. Watson joined the faculty at the University of Arizona Health Sciences Center in the Department of Family and Community Medicine of the School of Medicine. He is currently Professor of Health Promotion Sciences in the Mel and Enid Zuckerman Arizona College of Public Health.

Dr. Watson is a member of several national and international nutrition, immunology, cancer, and alcoholism research societies. Among his patents, he has one on a dietary supplement—passion fruit peel extract—with more pending. He continues to do research in animals and in clinical trials on dietary supplements and health, including studies using omega-3 fatty acids in heart disease prevention and therapy. For 30 years, he was funded by the Wallace Research Foundation to study dietary supplements in health promotion. Dr. Watson has edited more than 110 scientific reference books on nutrition, dietary supplements and over-the-counter agents, and drugs of abuse. He has published more than 500 research and review articles.

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