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Nutritional Neuroscience

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Preface

Nutritional neuroscience is an emerging, interdisciplinary field that relates directly to many health care and quality-of-life issues at the forefront of modern society. Scientific and commercial interest in nutritional neuroscience, and in the general areas of diet, nutrition, weight loss, and dietary supplements, has grown dramatically in the last 10 years. In 1994, as part of the Dietary Supplement Health and Education Act, the Congress of the United States authorized the establishment of the Office of Dietary Supplements at the National Institutes of Health. The journal *Nutritional Neuroscience*, which is devoted to the relationships between nutrition and brain function, was started in 1998 and is now indexed in Medline. Symposia, conferences, and other meetings addressing the relationships between brain function and diet are held regularly.

The regulatory status and availability of dietary supplements and similar products vary considerably from nation to nation, but in most countries a wide variety of these compounds can be obtained easily. In the United States, an extremely broad and diverse range of dietary supplements can be found not only at specialty health food stores, but at virtually all pharmacies, supermarkets and general merchandise outlets. Other products such as foods for weight loss, functional foods, nutraceuticals, and medical foods are also marketed, although in many cases the category to which a product is assigned may not be clearly defined. Many of these products are marketed for their effects on behavior or brain function, the focus of the field of nutritional neuroscience. Recommendations of diets for general health, weight loss, or specific medical conditions can be found in many popular publications, often with little validated scientific support.

This book will be of interest to a wide variety of readers who have backgrounds in nutrition, psychology, neuroscience, or a related clinical field such as medicine, clinical dietetics, nursing, or clinical psychology. The chapter authors were asked to make their respective contributions accessible to a more general audience than for a typical edited scientific volume written for specialists in the field. The contents of this volume are therefore quite diverse, and include material on methodological issues, as well as chapters addressing the effects of a wide range of foods, specific nutrients, food constituents, food additives, and dietary supplements on brain function and behavior.

We anticipate that this book will prove useful as an advanced undergraduate or graduate/professional textbook in courses that introduce the field of nutritional neuroscience. It also will be of great value to health care professionals who are considering the use of specific diets or dietary supplements in their practices, or who are frequently asked about nutrition, diet, and supplements by their patients. We also hope this volume will provide scientists who work in the field of nutritional neuroscience with a source of consolidated information in their own specialty, and allow them to become acquainted with subject matter areas with which they are not familiar. Even experts in this field, because of its interdisciplinary nature, often find it difficult to locate all the relevant literature on a particular topic using standard search methodologies.

In closing we would like to thank the authors of every chapter for their dedication and scholarly efforts that made this volume possible.

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Chandan Prasad, Ph.D.
Editors

Harris R. Lieberman is a research psychologist in the Military Nutrition Division of the U.S. Army Research Institute of Environmental Medicine (USARIEM) in Natick, Massachusetts. Dr. Lieberman is an internationally recognized expert in the area of nutrition and behavior and has published more than 100 original full-length papers in scientific journals and edited books. He has been an invited lecturer at numerous national and international conferences, government research laboratories, and universities.

Dr. Lieberman received his Ph.D. in physiological psychology in 1977 from the University of Florida. On completing his graduate training, he was awarded an NIH fellowship to conduct postdoctoral research at the Department of Psychology and Brain Science at the Massachusetts Institute of Technology (MIT). In 1980, he was appointed to the research staff at MIT and established an interdisciplinary research program in the Department of Brain and Cognitive Sciences to examine the effects of food constituents and drugs on human behavior and brain function. Key accomplishments of the laboratory included development of methods for assessing the effects of food constituents and environmental factors on human brain function and determination that specific foods and hormones reliably altered human performance and mood.

In 1990, Dr. Lieberman joined the civilian research staff of USARIEM, where he has continued his work in nutrition, behavior, and stress. From 1994 to 2000, he was chief or deputy chief of the Military Nutrition program at USARIEM. His recent research has addressed the effects of various nutritional factors, diets, and environmental stress on animal and human performance, brain function, and behavior. He holds two patents for novel technologies to assess and enhance cognitive performance. Dr. Lieberman currently chairs an International Defense Panel on Cognitive and Ergogenic Aids.

Robin B. Kanarek received a B.A. in biology from Antioch College in Yellow Springs, Ohio, and an M.S. and a Ph.D. in psychology from Rutgers University in New Brunswick, New Jersey. She is currently the dean of the Graduate School of Arts and Sciences and professor of psychology and nutrition at Tufts University in Medford, Massachusetts. Her primary research interests are in the area of nutrition and behavior. She has conducted research on the effects of nutritional variables on the development of obesity, the physiological and behavioral factors influencing diet selection in experimental animals and humans, the role of nutrients in determining the consequences of psychoactive drugs, and the importance of nutrition for cognitive behavior in children and adults. She has authored or coauthored more than 100 books, book chapters, and articles and has presented her research at numerous international and national conferences. Her research has been funded consistently for the last 25 years by the National Institutes of Health (NIH) as well as by other government agencies and private companies. Dr. Kanarek has been actively involved in graduate education and teaching throughout her time at Tufts, serving as the mentor for more than 15 Ph.D. students. In 2000, she was named John Wade Professor and received the Tufts University Senate Professor of the Year award.

Dr. Kanarek’s experience includes research fellow, Division of Endocrinology, University of California, Los Angeles (UCLA) School of Medicine, and research fellow in nutrition at Harvard University. She is a member of the editorial boards of Physiology and Behavior, Nutritional Neuroscience, and the Tufts Diet and Nutrition Newsletter and is a past editor-in-chief of Nutrition and Behavior. In addition, she regularly reviews articles for peer-reviewed journals, including Science, Brain Research Bulletin, Pharmacology Biochemistry and Behavior, Brain Research,
Journal of Nutrition, American Journal of Clinical Nutrition, and Annals of Internal Medicine. From 1995 to 2001, she was a member of the National Academy of Sciences, Committee on Military Nutrition Research. Dr. Kanarek also has served on review committees for the National Science Foundation, NIH, and USDA Nutrition Research and as a member of the Program Committee of the Eastern Psychological Association. She is a fellow of the International Society for Behavioral Neuroscience. Her other professional memberships include the Society for the Study of Ingestive Behavior and Society for Neurosciences.

Chandan Prasad graduated from Louisiana State University in 1970 with a Ph.D. in microbiology/biochemistry. After 8 years at the NIH in Bethesda, Maryland, as Fogerty fellow and senior staff fellow, he returned to New Orleans to join the faculty of the LSU School of Medicine. He is currently professor (medicine and neuroscience) and vice chairman (research) in the Department of Medicine at the LSU Health Sciences Center in New Orleans. The current focus of Dr. Prasad's research is on adipocyte biology and the role of dietary supplements in obesity, diabetes, and heart diseases. He has authored more than 200 papers in the area of appetite regulation, obesity, and nutrition. He holds four U.S. and international patents for treatment of obesity and alcoholism. He serves as editor-in-chief of Nutritional Neuroscience and associate editor of Current Topics in Nutraceutical Research. He also serves as series editor for Nutrition, Brain, and Behavior. He is married to Shail Gupta, M.A., and has three sons — Anand Prasad, B.S., M.D.; Amit Prasad, B.S., M.D. (student); and Anoop Prasad, B.S., J.D. (student).
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