Nutritional Neurosciences

Series Editor

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This book series aims to publish volumes focusing on both basic and clinical research in the field of nutritional neuroscience with a focus on delineating the effect of nutrition on brain function and behavior. The books will examine the role of different nutrients, food agents and supplements (both macro and micro) on brain health, neurodevelopment, neurochemistry, and behaviour. The books will examine the influence of diet, including phytochemicals, antioxidants, dietary supplements, food additives, and other nutrients on the physiology and metabolism of neurons, neurotransmitters and their receptors, cognition, behavior, and hormonal regulations.

The books will also cover the influence of nutrients and dietary supplements on the management of neurological disorders. It details the mechanism of action of phytonutrients on signaling pathways linked with protein folding, aggregation, and neuroinflammation. The books published in the series will be useful for neuroscientists, nutritionists, neurologists, psychiatrists, and those interested in preventive medicine.

Nasrollah Moradikor • Indranath Chatterjee •
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Editors

Nutrition in Brain Aging and Dementia

Springer

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Preface

In the book *Nutrition in Brain Aging and Dementia,* we embark on an enlightening exploration into the intricate connections between our dietary choices, the aging process of our minds, and the complex nature of dementia. Within the following pages, we will undertake a journey through the realms of neurology, shedding light on various aspects of dementia, deciphering the inner workings of the brain, and uncovering the factors that may heighten the risk of cognitive challenges.

This book is not a labyrinth of medical terminology; rather, it is crafted as a guided tour aimed at demystifying the symptoms, diagnoses, and treatments associated with dementia. As we navigate through these topics, our shared discovery will highlight the crucial role that nutrition plays in sustaining brain health and preventing the onset of dementia.

We strongly believe that you can picture this book as your trusted guide through the maze of information concerning dietary elements—proteins, micronutrients, and superfoods—and their potential to safeguard our cognitive function. We will also shine a light on the unsung heroes in our diet—vitamins like D and B12, natural antioxidants, and trace minerals—and explore how they can either act as defenders or challengers in the realm of dementia.

Our journey does not conclude there; we take a purposeful detour into the realm of herbal medicine, exploring its potential as a supplementary player in the drama of dementia therapy. Safety and efficacy are our guiding principles as we navigate this less-explored path, adding a rich layer to the narrative.

For those entrenched in the field—doctors, researchers, nutritionists, and healthcare professionals—this book stands as a well-stocked toolbox, offering evidence-based guidance in a field that is rapidly evolving. Consider it your set of strategies to combat the formidable foe that is dementia.

However, this journey is not exclusive to experts. It is an invitation for anyone seeking a deeper understanding of the delicate dance between what's on our plate, the aging of our minds, and the specter of dementia. Through the embrace of a multidisciplinary approach, this book aims to equip you with a comprehensive understanding, serving as a vital resource for those navigating the terrain of brain health.

So, let us embark on this expedition together, unraveling the complexities of diet, brain aging, and dementia with an approach that is both informative and easily comprehensible. Your toolkit for understanding, your roadmap for decision-making, and your companion on this journey await within these pages.

Exploring the intricate realm of dementia, our exploration guides us through pivotal sections. Initially, we investigate the pathophysiology, which involves comprehending the physiological alterations that result in cognitive impairment. Next, we explore both genetic and non-genetic risk variables, elucidating their respective roles in propensity. Progressing further, we will analyze the symptoms and diagnosis, providing insight into effectively traversing this complex terrain. This study is intended for brain researchers, neurologists, and healthcare professionals. Its goal is to provide practical insights that may improve patient outcomes. Moreover, it attracts the attention of experts in the fields of nutrition, pharmacology, and toxicology, therefore enhancing a comprehensive comprehension of the interplay between dementia and the domains of health, nutrition, and neuroscience.

Tbilisi, Georgia — Nasrollah Moradikor
Manchester, UK — Indranath Chatterjee
Kuantan, Pahang, Malaysia — Wael Mohamed

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We thank everyone who helped realize *Nutrition in Brain Aging and Dementia*. Your expertise, unshakable dedication, and genuine passion have greatly improved this book and helped us understand the intricate link between diet, brain aging, and dementia.

We thank the researchers, doctors, and healthcare professionals who generously shared their expertise and talents. This book is based on your innovative research and inspiring devotion to improving patient outcomes.

We thank dementia patients and their families for their insights and inspiration. Your perseverance inspires us to advance dementia research.

We thank our colleagues and mentors for their guidance, support, and encouragement while writing this book. Your expertise and direction helped create and ensure the material's quality. We are grateful to the publishers, editors, and reviewers who helped complete this project. Your dedication to quality and attention to detail helped create the final product.

Finally, we want to thank our families and loved ones for their unwavering support and understanding. Your patience and support have always given me strength and determination.Our comprehensive database should be useful to scholars, clinicians, and healthcare professionals. These sites' content may advance dementia research and worldwide patient care.

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Editors and Contributors

About the Editors

Nasrollah Moradikor, Ph.D. is currently Research Director and Head of Brain Aging and Dementia at the International Center for Neuroscience Research in Georgia. Dr. Nasrollah has demonstrated exceptional leadership skills in promoting applied neuroscience research and establishing fruitful collaborations among scientists worldwide. In 2021, Dr. Nasrollah founded a new community platform named "Neuroscience Network" to support and develop neuroscience in the world. His ability to create a supportive and intellectually stimulating environment has been instrumental in promoting the development of aspiring neuroscientists. He has over 15 years of research and teaching experience and till now he has chaired many national and international events in the area of neuroscience. Nasrollah has been on the scientific advisory board and evaluation committees of several institutions abroad. He has published more than 100 scientific papers, and he currently serves as an editor, editorial board member, and section editor of several reputed journals in the field of neuroscience. His contributions to the scientific community are evident through his publications, as well as more than 15 years of editorial expertise. He is an active professional member of IBRO, FENS, EBBS, ISN, ESN, and MDS.

Indranath Chatterjee, Ph.D. is working as an assistant professor in the Department of Computer and Mathematics at Manchester Metropolitan University, UK. He is also working as an Adjunct Professor at the Woxsen University, India. He also holds the position of Director (International Collaborations) of The Korea Multimedia Society (KMMS), South Korea. Before that, he worked as an Assistant Professor at Tongmyong University, South Korea for around 5 years and at JK Lakshmipat University, India for around 1 year. He also worked as Research Director at Total Soft Bank, Pvt. Ltd., South Korea for a year. He received his Ph.D. in Computational Neuroscience from the University of Delhi, India. His research areas include Computational Neuroscience, Schizophrenia, Neuroimaging, and Machine learning. He has authored and edited 11 books on Computer Science

and Neuroscience published by renowned international publishers. To date, he has published numerous research papers in international journals and conferences. To date, he has completed seven sponsored R&D projects as PI from Govt. and Industries. He is a recipient of various global awards in neuroscience. Throughout his career, he has presented 26 keynote/plenary talks at various international conferences and seminars worldwide. He is currently serving as a Chief Section Editor of a few renowned international journals and serving as a member of the Advisory board and Editorial board of various international journals and Open-Science organizations worldwide. He is an active professional member of the FENS, Belgium; ACM, USA; KMMS, Korea; OHBM, USA; ACNM, India; ALBA Network (Belgium); SONA, South Africa, and INCF, Sweden.

Dr. Wael Mohamed, MD, Ph.D. is a physician neuroscientist. Dr. Mohamed got his PhD from PSU, USA and is currently working as an assistant professor in IIUM Medical School, Malaysia. Dr. Mohamed has been invited to deliver more than 150 lectures locally and abroad. He published over 120 peer-reviewed papers related to Neuroscience/Psychiatry with an h-index of 23. Moreover, he is an editor in several prestigious Journals with editing many journal special issues on brain disorders. Additionally, he is editing few books in neuroscience field with leading publishers. He received many research grants from national and international organizations namely IBRO, ISN, MJF, STDF, FRGS and INDO-ASEAN with a total research funding of half a million US$. He is the founder of AfrAbia PD Genomic Consortium (AA-PD-GC).

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