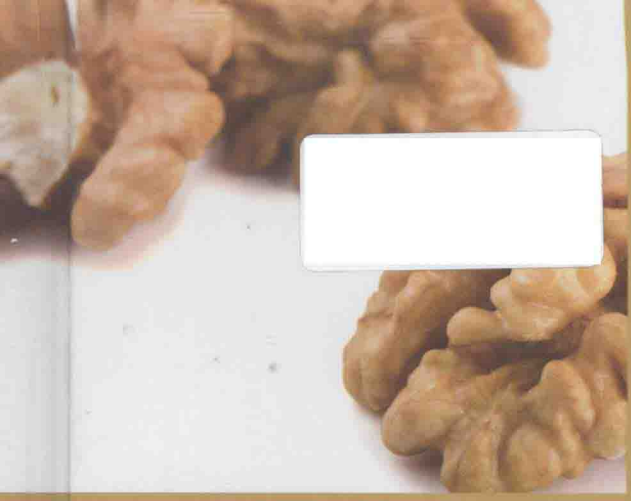

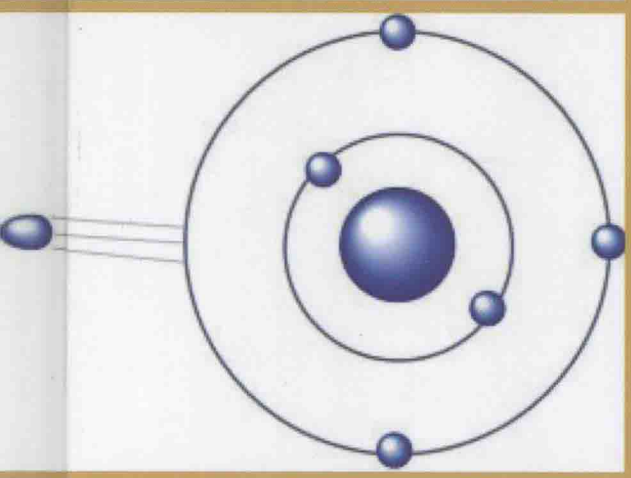

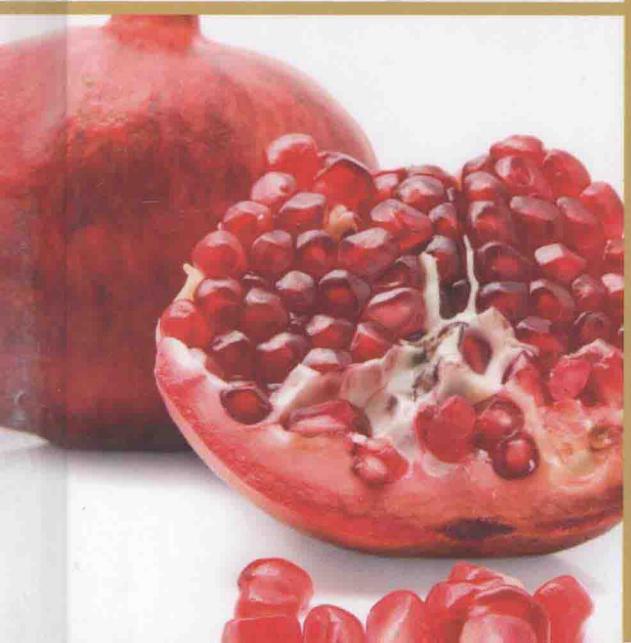

DIABETES

Oxidative Stress and Dietary Antioxidants

Edited by
VICTOR R. PREEDY

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The series **Oxidative Stress and Dietary Antioxidants** aims to address deficiencies in books on dietary antioxidants by combining, in a single volume, the science of oxidative stress and the putative therapeutic usage of natural antioxidants in the diet, its food matrix or plants. Companion volumes in this series include Aging and Cancer.

In **Diabetes: Oxidative Stress and Dietary Antioxidants,** holistic information is imparted within a structured format of two main sections:

I. **Oxidative Stress and Diabetes**

II. **Antioxidants and Diabetes**

The first section, **Oxidative Stress and Diabetes,** covers the basic biology of oxidative stress from molecular biology to physiological pathology. Topics include mitochondria, iron, neuropathy, cerebral ischemia, cardiomyopathy and retinopathy. The second section, **Antioxidants and Diabetes,** covers spices and herbs, including red sage, chrysanthemi flos, *Ginkgo biloba*, pomegranate juice, polyphenols, α-tocopherol and tocotrienols, lutein, vitamin D, taurine, glutamine, statins, docosahexaenoic acid, resveratrol, micronutrients and many other antioxidants. Both preclinical and clinical studies are embraced using an evidence-based approach. However, the science of oxidative stress is not described in isolation but in concert with other processes such as apoptosis, cell signaling, receptor mediated responses and so on. This approach recognizes that diseases are often multifactorial and that oxidative stress is a single component of this.

The series is designed for dietitians and nutritionists, food scientists, as well as health care workers and research scientists. Contributions are from leading national and international experts including those from world renowned institutions.

About the Editor

Victor R. Preedy BSc, PhD, DSc, CBiol, FSB, FRSH, FRIPH, FRSPH, FRCPath, FRSC is a senior member of King's College London (Professor of Nutritional Biochemistry) and King's College Hospital (Professor of Clinical Biochemistry). He is attached to both the Diabetes and Nutritional Sciences Division and the Department of Nutrition and Dietetics. He is also Director of the Genomics Centre and a member of the School of Medicine. Professor Preedy graduated in 1974 with an Honours Degree in Biology and Physiology with Pharmacology. He gained his University of London PhD in 1981. In 1992, he received his Membership of the Royal College of Pathologists and in 1993 he gained his second doctoral degree, for his outstanding contribution to protein metabolism in health and disease. Professor Preedy was elected as a Fellow to the Institute of Biology in 1995 and 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) and The Royal Institute of Public Health (2004). In 2009, Professor Preedy became a Fellow of the Royal Society for Public Health and in 2012 a Fellow of the Royal Society of Chemistry. In his career, Professor Preedy has carried out research at the National Heart Hospital (part of Imperial College London) and the MRC Centre at Northwick Park Hospital. He has collaborated with research groups in Finland, Japan, Australia, USA and Germany. He is a leading expert on the science of health and has had a long standing interest in biomarkers for over 25 years, especially related to tissue pathology. He has lectured nationally and internationally. To his credit, Professor Preedy has published over 570 articles, which includes 165 peer-reviewed manuscripts based on original research, 100 reviews and over 50 books and volumes.

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Oxidative Stress and Dietary Antioxidants

Edited by

VICTOR R. PREEDY BSc, PhD, DSc, CBiol, FSB, FRSH, FRIPH, FRSPH, FRCPath, FRSC
Department of Nutrition and Dietetics, School of Medicine, King's College London, London, UK

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DIABETES

Preface

In the past few decades there have been major advances in our understanding of the etiology of disease and its causative mechanisms. Increasingly it is becoming evident that free radicals are contributory agents: either to initiate or propagate the pathology or to add to an overall imbalance. Furthermore, reduced dietary antioxidants can also lead to specific diseases and preclinical organ dysfunction. On the other hand, there is abundant evidence that dietary and other naturally occurring antioxidants can be used to prevent, ameliorate or impede such diseases. The science of oxidative stress and free radical biology is rapidly advancing and new approaches include the examination of polymorphism and molecular biology. The more traditional sciences associated with organ functionality continue to be explored but their practical or translational applications are now more sophisticated.

However, most textbooks on dietary antioxidants do not have material on the fundamental biology of free radicals, especially their molecular and cellular effects on pathology. They also fail to include material on the nutrients and foods which contain anti-oxidative activity. In contrast, most books on free radicals and organs disease have little or no text on the usage of natural antioxidants.

The series ***Oxidative Stress and Dietary Antioxidants*** aims to address the aforementioned deficiencies in the knowledge base by combining in a single volume the science of oxidative stress and the putative therapeutic usage of natural antioxidants in the diet, its food matrix or plants. This is done in relation to a single organ, disease or pathology. These include cancer, addictions, immunology, HIV, ageing, cognition, endocrinology, pregnancy and fetal growth, obesity, exercise, liver, kidney, lungs, reproductive organs, gastrointestinal tract, oral health, muscle, bone, heart, kidney and the CNS.

In the present volume, ***Diabetes: Oxidative Stress and Dietary Antioxidants,*** holistic information is imparted within a structured format of two main sections:

I. Oxidative Stress and Diabetes.
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The first section, Oxidative Stress and Diabetes, covers the basic biology of oxidative stress from molecular biology to physiological pathology. Topics include mitochondria, iron, neuropathy, cerebral ischemia, cardiomyopathy and retinopathy. The second section, Antioxidants and Diabetes, covers spices and herbs, including red sage, chrysanthemi flos, *Ginkgo biloba*, pomegranate juice, polyphenols, alpha-tocopherol and tocotrienols, lutein, Vitamin D, taurine, glutamine, statins, docosahexaenoic acid, resveratrol, micronutrients and many other antioxidants. Both preclinical and clinical studies are embraced using an evidence-based approach. An important cautionary note is required as in many cases more in-depth clinical studies are required to determine safety and therapeutic efficacy. However, the science of oxidative stress is not described in isolation but in concert with other processes such as apoptosis, cell signalling, receptor mediated responses and so on. This approach recognizes that diseases are often multifactorial and that oxidative stress is a single component of this.

The series is designed for dietitians and nutritionists, and food scientists, as well as health care workers and research scientists. Contributions are from leading national and international experts including those from world renowned institutions.

Professor Victor R Preedy, King's College London

Contributors

Amanda I. Adler Wolfson Diabetes & Endocrine Clinic, Cambridge University Hospitals NHS Foundation Trust, Addenbrooke's Treatment Centre, Cambridge, United Kingdom

Emma Arnal Fundación Oftalmológica del Mediterráneo, Valencia, Spain

Vipin Arora Pharmacology Research Laboratory, University Institute of Pharmaceutical Sciences, UGC Center of Advanced Study, Panjab University, Chandigarh, India

Denise M. Arrick Department of Cellular Biology and Anatomy, and Center of Excellence in Cardiovascular Diseases and Sciences, Louisiana State University Health Sciences Center-Shreveport, Shreveport, LA, USA

Somasundaram Arumugam Dept. of Clinical Pharmacology, Niigata University of Pharmacy and Applied Life Sciences, Niigata Shi, Japan

Maria Luisa Balestrieri Department of Biochemistry, Biophysics and General Pathology, Second University of Naples, Naples, Italy

Arpita Basu Department of Nutritional Sciences, Oklahoma State University, Stillwater, OK, USA

Pál Brasnyó Second Department of Medicine and Nephrological Center, Faculty of Medicine, University of Pécs, Pécs, Hungary

Alecia L. Bryant Department of Nutritional Sciences, Oklahoma State University, Stillwater, OK, USA

Maria Carmela Capoluongo Department of Geriatrics and Metabolic Diseases, Naples, Italy

Roberta Cazzola Department of Biomedical and Clinical Sciences 'L. Sacco', University of Milan, Milan, Italy

Benvenuto Cestaro Department of Biomedical and Clinical Sciences 'L. Sacco', University of Milan, Milan, Italy

Kanwaljit Chopra Pharmacology Research Laboratory, University Institute of Pharmaceutical Sciences, UGC Center of Advanced Study, Panjab University, Chandigarh, India

Zafer Cukurova Bakirkoy Dr. Sadi Konuk Training and Research Hospital, Department of Anaesthesiology and Intensive Care, Istanbul, Turkey

Nunzia D'Onofrio Department of Biochemistry, Biophysics and General Pathology, Second University of Naples, Naples, Italy

Joydeep Das Division of Molecular Medicine, Bose Institute, Kolkata, India

Kunjan R. Dave The Cerebral Vascular Disease Research Laboratories, Department of Neurology Leonard M. Miller School of Medicine, University of Miami, Miami, FL, USA

Monica del-Rio-Vellosillo Department of Anesthesiology, University Hospital La Arrixaca, El Palmar, Murcia, Spain

Mala Dharmalingam Department of Endocrinology, M.S. Ramaiah Medical College, MSRIT Post, Bangalore, India

Gulay Eren Bakirkoy Dr. Sadi Konuk Training and Research Hospital, Department of Anaesthesiology and Intensive Care, Istanbul, Turkey

Perry Fuchs The Cerebral Vascular Disease Research Laboratories, Department of Neurology Leonard M. Miller School of Medicine, University of Miami, Miami, FL, USA

Roberto Gallego-Pinazo Department of Ophthalmology, University and Polytechnic Hospital La Fe, Valencia, Spain

Jose Javier Garcia-Medina Department of Ophthalmology, University General Hospital Reina Sofía and Department of Ophthalmology and Optometry, School of Medicine, University of Murcia, Murcia, Spain

Manuel Garcia-Medina Department of Ophthalmology, Torrecardenas Hospital, Almeria, Spain

Hagit Goldenstein The Ruth and Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel

Oya Hergunsel Bakirkoy Dr. Sadi Konuk Training and Research Hospital, Department of Anaesthesiology and Intensive Care, Istanbul, Turkey

Yu-Chen Hou School of Nutrition and Health Sciences, Taipei Medical University, Taipei, Taiwan

Siv Johnsen-Soriano Fundación Oftalmológica del Mediterráneo, Valencia, Spain

Vengadeshprabhu Karuppagounder Dept. of Clinical Pharmacology, Niigata University of Pharmacy and Applied Life Sciences, Niigata Shi, Japan

Sung-Jin Kim Department of Pharmacology and Toxicology, School of Dentistry, Kyung Hee University, Seoul, Republic of Korea

Anurag Kuhad Pharmacology Research Laboratory, University Institute of Pharmaceutical Sciences, UGC Center of Advanced Study, Panjab University, Chandigarh, India

Christine Lee Department of Nutritional Sciences, University of Toronto, Toronto, ON, Canada

Andrew P. Levy The Ruth and Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel

Soo Lim Department of Internal Medicine, Seoul National University College of Medicine, Seoul, South Korea, Seoul National University Bundang Hospital, Seoul, Republic of Korea

Liania Alves Luzia Department of Nutrition, Public Health School, University of Sao Paulo, Sao Paulo, Brazil

Timothy J. Lyons Section of Endocrinology and Diabetes, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA

Sara Rani Marcus MSU-GEF International Medical School, MSRIT Post, Bangalore, India

Raffaele Marfella Department of Geriatrics and Metabolic Diseases, Naples, Italy

William G. Mayhan Department of Cellular Biology and Anatomy, and Center of Excellence in Cardiovascular Diseases and Sciences, Louisiana State University Health Sciences Center-Shreveport, Shreveport, LA, USA

María Miranda Universidad CEU Cardenal Herrera, Moncada, Spain

Jonathan R. Murrow Georgia Regents University – University of Georgia Medical Partnership, Athens, GA, USA

Tirang R. Neyestani National Nutrition and Food Technology Research Institute (NNFTRI) and Faculty of Nutrition Science and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Yoko Ozawa Laboratory of Retinal Cell Biology, Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan

Giuseppe Paolisso Department of Geriatrics and Metabolic Diseases, Naples, Italy

Yongsoo Park Department of Internal Medicine and Bioengineering, Hanyang University, Seoul, Republic of Korea

Kyong Soo Park Department of Internal Medicine, Seoul National University College of Medicine, Seoul, South Korea

Vinood B. Patel Department of Biomedical Science, Faculty of Science & Technology, University of Westminster, London, UK

Miguel A. Perez-Pinzon The Cerebral Vascular Disease Research Laboratories, Department of Neurology Leonard M. Miller School of Medicine, University of Miami, Miami, FL, USA; Neuroscience Program, Department of Neurology Leonard M. Miller School of Medicine, University of Miami, Miami, FL, USA

Maria Dolores Pinazo-Duran Ophthalmology Research Unit 'Santiago Grisolia' and Department of Surgery, School of Medicine, University of Valencia, Valencia, Spain

Vigneshwaran Pitchaimani Dept. of Clinical Pharmacology, Niigata University of Pharmacy and Applied Life Sciences, Niigata Shi, Japan

Qingwen Qian Department of Medicine, First Affiliated Hospital, Zhengzhou University, Zhengzhou, China

Shuhong Qian Department of Clinical Laboratory, First Affiliated Hospital, Zhengzhou University, Zhengzhou, China

Maria Rosaria Rizzo Department of Geriatrics and Metabolic Diseases, Naples, Italy

Francisco J. Romero Fundación Oftalmológica del Mediterráneo, Valencia, Spain, Facultad de Medicina, Universidad Católica de Valencia 'San Vicente Mártir', Valencia, Spain

Patricia Helen Rondo Department of Nutrition, Public Health School, University of Sao Paulo, Sao Paulo, Brazil

Mariko Sasaki Laboratory of Retinal Cell Biology, Department of Ophthalmology, Keio University School of Medicine, Tokyo, Japan

Luigi Servillo Department of Biochemistry, Biophysics and General Pathology, Second University of Naples, Naples, Italy

Parames C. Sil Division of Molecular Medicine, Bose Institute, Kolkata, India

Ivana Sirangelo Department of Biochemistry, Biophysics and General Pathology, Second University of Naples, Naples, Italy

Hirohito Sone Dept. of Internal Medicine, Division of Hematology, Endocrinology and Metabolism, Niigata University Faculty of Medicine, Niigata, Japan

Balázs Sümegi Department of Biochemistry and Medical Chemistry, Faculty of Medicine, University of Pécs, Pécs, Hungary

Rajarajan A. Thandavarayan Dept. of Clinical Pharmacology, Niigata University of Pharmacy and Applied Life Sciences, Niigata, Japan

Victor M. Victor Fundacion para la Investigacion Sanitaria y Biomedica de la Comunidad Valenciana FISABIO, University Hospital Doctor Peset, Endocrinology Service, Avda Gaspar Aguilar, Valencia, Spain, Fundacion para la Investigación (INCLIVA), Department of Pharmacology and CIBER CB06/04/0071 Research Group, CIBER Hepatic and Digestive Diseases, and Department of Physiology, University of Valencia, Valencia, Spain

John Ward The Ruth and Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel

Kenichi Watanabe Dept. of Clinical Pharmacology, Niigata University of Pharmacy and Applied Life Sciences, Niigata, Japan

Gábor Winkler Second Department of Internal Medicine-Diabetology, St. John's Hospital, Budapest, Hungary

István Wittmann Second Department of Medicine and Nephrological Center, Faculty of Medicine, University of Pécs, Pécs, Hungary

Sung-Ling Yeh School of Nutrition and Health Sciences, Taipei Medical University, Taipei, Taiwan

Vicente Zanon-Moreno Genetic and Molecular Epidemiology Unit, Department of Preventive Medicine and Public Health, School of Medicine, University of Valencia and CIBER Fisiopatología de la Obesidad y Nutrición, Valencia, Spain

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SECTION I

OXIDATIVE STRESS AND DIABETES

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