Advances in Diabetes Research and Management

Rana Noor
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Editor
Rana Noor
Faculty of Dentistry
Department of Biochemistry
Jamia Millia Islamia
New Delhi, India

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Preface

Diabetes mellitus is a major health problem affecting approximately 425 million people worldwide. Physiologically, the body is unable to control blood glucose levels in the blood which results in high blood glucose (hyperglycemia). The implications of hyperglycemia are frequent urination, weight loss, cardiovascular diseases, and damage to nerves, kidneys, and eyes. Diabetes mellitus is classified into Type I and Type II, while the former present in 5–10% of the population occurs when the immune system of the body damages insulin-producing B-cells of the pancreas leading to a deficiency of insulin in the body. Type 2 diabetes is the more common form of the disease characterized by the loss of ability to respond to insulin. This book discuss the latest research in the field of diabetes and management and also presents the new technologies that have been introduced to facilitate early diagnosis and the new potential therapies for these complications. It highlight the molecular mechanisms of the microvascular and macrovascular complications of diabetes 2 mellitus and review the most prevalent microvascular complications. The book discusses the molecular mechanisms involved in the development of diabetic complications. It also explore the molecular mechanisms of metabolic and immunological abnormalities affecting several organs due to diabetes and discuss the applications of nanotechnology for diagnostics, monitoring, and treatment for diabetes. It reviews the development of novel glucose measurement and insulin delivery strategies for diabetes management. The chapter also examine the point-of-care (POC) diagnostics for enhancing glucose measuring sensitivity, temporal response, and discusses a closed-loop system that continuously monitors blood glucose and releases insulin in a controlled and self-regulated fashion. Importantly, it reviews the immense potential of stem cell therapy in diabetes mellitus and molecular mechanisms that relate gut microbiota to the onset of insulin resistance and diabetes. It is a valuable source for students, researchers, and practitioners working in the area of glucose metabolism, diabetes, and endocrinologists.

New Delhi, India — Rana Noor

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Editor and Contributors

About the Editor

Rana Noor is currently working at the Faculty of Dentistry, Jamia Millia Islamia, New Delhi, India. She pursued her Ph.D. in Biochemistry from Aligarh Muslim University, India, in the year 2003. Her research work is highly interdisciplinary, spanning a wide range in protein biochemistry, enzymology, and application of biochemistry in dentistry. She is an editorial board member of various reputed journals.

Contributors

Chandan Kumar Acharya Department of Botany, Dr CV Raman University, Bilsapur, Chhattisgarh, India
Department of Botany, Bajkul Milani Mahavidyalaya, Kolkata, West Bengal, India

Rajesh Nanda Amarnath Department of Obstetrics and Gynecology, Apollo Womens Hospital, Chennai, India

Sheerin Bashar School of Forensic Sciences, Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Biplab Kumar Behera Department of Zoology, Siliguri College, Siliguri, West Bengal, India

Paramita Biswas Regional Research Sub Station (OAZ), Uttar Banga Krishi Viswavidyalaya, Malda, West Bengal, India

Titas Biswas Department of Chemistry, Gurudas College, Kolkata, West Bengal, India

Aditi Chakraborty SHRM Biotechnologies Pvt. Ltd., Kolkata, West Bengal, India

Dibyashree Chhetri Cancer Science Laboratory, Department of Biotechnology, School of Bioengineering, SRM Institute of Science and Technology, Chengalpattu, India

Aishwariya Das School of Biotechnology and Bioinformatics, D Y Patil University, Navi Mumbai, Maharashtra, India

Balaram Das Department of Physiology, Belda College, Medinipur, West Bengal, India

Manna De Department of Botany, Dr CV Raman University, Bilsapur, Chhattisgarh, India

Geevaprabhakaran Ganesan Chettinad Hospital & Research Institute, Chettinad Academy of Research and Education (Deemed to be University), Kelambakkam, Chennai, Tamil Nadu, India

Dhanavathy Gnanasampanthapandian Cancer Science Laboratory, Department of Biotechnology, School of Bioengineering, SRM Institute of Science and Technology, Chengalpattu, India

Kartik Jana SHRM Biotechnologies Pvt. Ltd., Kolkata, West Bengal, India

Selvaraj Jayaraman Centre of Molecular Medicine and Diagnostics (COMManD), Department of Biochemistry, Saveetha Dental College & Hospital, Saveetha Institute of Medical & Technical Sciences, Saveetha University, Chennai, India

Iyshwarya Bhaskar Kalarani Human Cytogenetics and Genomics Laboratory, Faculty of Allied Health Sciences, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu, India

Chandrashekar Kirubhanand Department of Anatomy, All India Institute of Medical Sciences, Nagpur, Maharashtra, India

Langeswaran Kulanthaivel Molecular Cancer Biology Lab, Department of Biotechnology, Science Campus, Alagappa University, Karaikudi, Tamil Nadu, India

S. Gowtham Kumar Faculty of Allied Health Sciences, Chettinad Hospital & Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Chennai, Tamil Nadu, India

K. Kumar Ebenezar Natural Medicine and Molecular Physiology Lab, Faculty of Allied Health Sciences, Chettinad Hospital and Research Institute, Chettinad Academy of Research & Education, Kelambakkam, Chennai, Tamil Nadu, India

K. Langeswaran Molecular Cancer Biology Laboratory, Department of Biotechnology, Science Campus, Alagappa University, Karaikudi, Tamil Nadu, India

Nithar Ranjan Madhu Department of Zoology, Acharya Prafulla Chandra College, New Barrackpore, West Bengal, India

Raktim Mukherjee Shree PM Patel Institute of PG Studies and Research in Science, Sardar Patel University, Anand, India

K. T. Nachammai Molecular Cancer Biology Laboratory, Department of Biotechnology, Science Campus, Alagappa University, Karaikudi, Tamil Nadu, India

V. Nithya Department of Animal Health and Management, Science Campus, Alagappa University, Karaikudi, India

Kanagaraj Palaniyandi Cancer Science Laboratory, Department of Biotechnology, School of Bioengineering, SRM Institute of Science and Technology, Chengalpattu, India

Swetha Panneerselvam Centre of Molecular Medicine and Diagnostics (COMManD), Department of Biochemistry, Saveetha Dental College & Hospital, Saveetha Institute of Medical & Technical Sciences, Saveetha University, Chennai, India

Bhuvaneswari Ponnusamy Centre of Molecular Medicine and Diagnostics (COMManD), Department of Biochemistry, Saveetha Dental College & Hospital, Saveetha Institute of Medical & Technical Sciences, Saveetha University, Chennai, India

D. Prabu Department of Microbiology, Dr. ALM PG IBMS, University of Madras, Taramani Campus, Chennai, Tamil Nadu, India

Natesan Sella Raja Membrane-Protein Interaction Lab, Department of Genetic Engineering, School of Bio-engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India

Ponnulakshmi Rajagopal Department of Central Research Laboratory, Meenakhsi Ammal Dental College and Hospitals, Meenakhsi Academy of Higher Education and Research, Chennai, India

Rupak Roy SHRM Biotechnologies Pvt. Ltd., Kolkata, West Bengal, India

Sunita Samal Department of Medical Gastroenterology, SRM Medical College Hospital and Research Centre, SRM Institute of Science and Technology, Chengalpattu, India

P. Sangavi Department of Bioinformatics, Science campus, Alagappa University, Karaikudi, India

S. Santhi Priya Natural Medicine and Molecular Physiology Lab, Faculty of Allied Health Sciences, Chettinad Hospital and Research Institute, Chettinad Academy of Research & Education, Kelambakkam, Chennai, Tamil Nadu, India

Bhanumati Sarkar Department of Botany, Acharya Prafulla Chandra College, New Barrackpore, West Bengal, India

Somnath Sau Department of Nutrition, Egra S.S.B. College, Medinipur, West Bengal, India
Department of Physiology, Belda College, Medinipur, West Bengal, India

Varsha Singh Membrane-Protein Interaction Lab, Department of Genetic Engineering, School of Bio-engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India

Subhashree Sivakumar Membrane-Protein Interaction Lab, Department of Genetic Engineering, School of Bio-engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India

R. Srinithi Department of Bioinformatics, Science campus, Alagappa University, Karaikudi, India

Gowtham Kumar Subbaraj Faculty of Allied Health Sciences, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education (Deemed to be University), Kelambakkam, Chennai, Tamil Nadu, India

Taniya Sur Department of Biotechnology, KIIT School of Biotechnology, KIIT University, Bhubaneswar, India

Sambit Tarafdar Amity Institute of Virology and Immunology, Amity University, Noida, India

Ramakrishnan Veerabathiran Human Cytogenetics and Genomics Laboratory, Faculty of Allied Health Sciences, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu, India