



# Current Developments in Biotechnology and Bioengineering

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Advanced Membrane Separation  
Processes for Sustainable Water and  
Wastewater Management –  
Anaerobic Membrane Bioreactor  
Processes and Technologies

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# Preface

The book titled *Advanced Membrane Separation Processes for Sustainable Water and Wastewater Management – Anaerobic Membrane Bioreactor Processes and Technologies* is a part of the comprehensive series on *Current Developments in Biotechnology & Bioengineering* (Editor-in-Chief: Ashok Pandey), in which overall three books are included on Advanced Membrane Separation Processes for Sustainable Water and Wastewater Management. This book is one of these three books and it covers advances in anaerobic membrane bioreactors (MBR) processes and technologies.

Limited water resources and water scarcity are always one of the intractable public concerns and global issues. However, this deteriorating situation could be alleviated through sustainable water reclamation schemes, including the use of suitable wastewater treatment technologies. Over the past decades, anaerobic biological treatment technologies have been introduced as an attractive alternative to conventional aerobic biotechnologies due to their superior advantages in pollution reduction, energy production (biogas generation), and reduction in sludge generation.

The global MBR market is expected to reach USD 8.27 billion by 2025. Anaerobic membrane bioreactors (AnMBR) are becoming an advanced technology for wastewater treatment and reuse. As advanced membrane-based bioprocesses are well developed and beneficial to water recycling and reuse, membrane bioreactors (MBRs) are now gaining fast growth in a wide range of applications and have become one of the most promising technologies for the 21st century to advance waste sustainability. To overcome the problems associated with poor retention of anaerobic microorganisms in conventional anaerobic bioprocesses and high-energy demand in aerobic MBRs due to aeration, anaerobic membrane bioreactors have been considered as an innovative approach.

This book provides a holistic overview of the status of the recent progress in AnMBR applications for wastewater treatment, including the fundamental aspects and development of AnMBR processes, as well as the needs of further research and industrialization. The book will also give special emphasis and discussion on the performance challenges of the AnMBR technology (e.g., membrane fouling issue, energy production and priority substances, and emerging contaminants removal, etc.) and bottlenecks regarding its applications. As a future green bioprocess, biogas production and waste minimization, opportunities, future perspectives and research needs are also discussed.

This book is an excellent reference for education and understanding of biotechnology, microbiology, environmental science and technology, environmental engineering, chemical Engineering, biotechnology & bioengineering R&D.

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