J. Wingender
T. R. Neu
H.-C. Flemming (Eds.)

Microbial Extracellular Polymeric Substances

Characterization, Structure and Function

Springer

Microbial Extracellular Polymeric Substances Characterization Structure And Function

Jost Wingender,Thomas R Neu,Hans-Curt Flemming

Microbial Extracellular Polymeric Substances Characterization Structure And Function:

Microbial Extracellular Polymeric Substances Jost Wingender,Thomas R. Neu,Hans-Curt Flemming,2012-12-06 Microbial extracellular polymeric substances EPS are the key components for the aggregation of microorganisms in biofilms flocs and sludge They are composed of polysaccharides proteins nucleic acids lipids and other biological macromolecules EPS provide a highly hydrated gel matrix in which microbial cells can establish stable synergistic consortia Cohesion and adhesion as well as morphology structure biological function and other properties such as mechanical stability diffusion sorption and optical properties of microbial aggregates are determined by the EPS matrix Also the protection of biofilm organisms against biocides is attributed to the EPS Their matrix allows phase separation in biofiltration and is also important for the degradation of particulate material which is of great importance for the self purification processes in surface waters and for waste water treatment **Microbial Extracellular Polymeric Substances** Jost Wingender,Thomas R Neu,Hans-Curt Flemming,1999-10-20 Microbial extracellular polymeric substances EPS are the key components for the aggregation of microorganisms in biofilms flocs and sludge They are composed of polysaccharides proteins nucleic acids lipids and other biological macromolecules EPS provide a highly hydrated gel matrix in which microbial cells can establish stable synergistic consortia Cohesion and adhesion as well as morphology structure biological function and other properties such as mechanical stability diffusion sorption and optical properties of microbial aggregates are determined by the EPS matrix Also the protection of biofilm organisms against biocides is attributed to the EPS Their matrix allows phase separation in biofiltration and is also important for the degradation of particulate material which is of great importance for the self purification processes in surface waters and for waste water treatment In this volume analysis characterization composition regulation function and interactions of microbial EPS are covered Advances in Applied Microbiology Geoffrey M. Gadd,Sima Sariaslani,2023-10-30 Advances in Applied Microbiology Volume 125 continues the comprehensive reach of this widely read and authoritative review source in microbiology Users will find invaluable references and information on a variety of areas relating to the topics of microbiology Contains contributions from leading authorities in the field Informs and updates on the latest developments in the field of microbiology Includes discussions on the role of specific molecules in pathogen life stages interactions and much more **High-Value Bioenergy Recovery from Wastewater** Bing-Jie Ni,Xuran Liu,2026-01-23 High Value Bioenergy Recovery from Wastewater presents the science and technologies behind high value liquid colloid and solid bioenergy recovery in municipal sewage treatment plants thus allowing for the easy collection storage and transportation of recovered bioenergy Broken into four parts the book addresses potential high value bioenergy from sewage the science behind and technical module related to high value liquid bioenergy recovery and high value colloid and solid bioenergy recovery and concludes with integrated modules for high value bioenergy recovery Academic and industry researchers working in bioenergy scientists and engineers working in the treatment of wastewater

and industry practitioners who are interested in adding value to the sewage and the sludge obtained in the treatment of wastewater will benefit from this reference as will advanced graduate and post graduate students interested in bioenergy and wastewater treatment Provides a comprehensive overview of the science and technologies for high value bioenergy recovery in municipal sewage treatment plants Discusses the endogenous and exogenous influencing factors and control strategies in high value bioenergy production and recovery from sewage and sludge Summarizes the relevant socioeconomic aspects and lifecycle assessments of high value bioenergy recovery modules for integration into MSTPs **Nanoscale Structure and Properties of Microbial Cell Surfaces** Elena P. Ivanova,2007 This book presents an accessible and comprehensive survey of recent advances in the understanding of the structure and properties of microbial cell surfaces Gathering leading experts in the field it is the first book to cover the fundamental knowledge of microbial cell surfaces at the nanometre scale resolution that is now provided by various scanning probe microscopy techniques SPM The advent of SPM has recently opened up a wide range of novel and fascinating applications for biological research The book presents the most recent advances in the application of SPM techniques to study cell surfaces It is a useful guide for researchers that are seeking to tap the power and scope of this technology to further their own work on cell surface structure and properties The book also provides the reader with a realistic appreciation of the advantages and limitations of the SPM techniques as well as the potential of these techniques to advance our understanding of biological systems to a new level **Roles of Extracellular Polymeric Substances (EPS) in the Transport, Retention, Detachment, and Deposition of Trichloroethylene (TCE) Degrading Toluene Oxidizing Bacteria in Porous Media** Aksara Putthividhya,2004 Pulp and Paper Industry Pratima Bajpai,2015-04-09 Pulp and Paper Industry Microbiological Issues in Papermaking features in depth and thorough coverage of microbiological issues in papermaking and their consequences and the current state of the different alternatives for prevention treatment and control of biofilm slime considering the impact of the actual technological changes in papermaking on the control programmes The microbial issues in paper mill systems chemistry of deposits on paper machines the strategies for deposit control and methods used for the analysis of biofouling are all dealt in this book along with various growth prevention methods The traditional use of biocides is discussed taken into account the new environmental regulations regarding their use Finally discusses the trends regarding the future of the microbiological control in papermaking systems In depth coverage of microbiological issues in papermaking and their consequences Discusses eco efficient processes green processes for biofilm slime control Offers a thorough review of the current literature with links to the primary literature Comprehensive indexing Author is an authority in the pulp and paper industry *Multi-Scale Biogeochemical Processes in Soil Ecosystems* Yu Yang,Marco Keiluweit,Nicola Senesi,Baoshan Xing,2022-03-23 MULTI SCALE BIOGEOCHEMICAL PROCESSES IN SOIL ECOSYSTEMS Provides a state of the art overview of research in soil biogeochemical processes and strategies for greenhouse gas mitigation under climate change Food security and soil health

for the rapidly growing human population are threatened by increased temperature and drought soil erosion and soil quality degradation and other problems caused by human activities and a changing climate Because greenhouse gas emission is the primary driver of climate change a complete understanding of the cycles of carbon and major nutritional elements is critical for developing innovative strategies to sustain agricultural development and environmental conservation Multi Scale Biogeochemical Processes in Soil Ecosystems Critical Reactions and Resilience to Climate Changes is an up to date overview of recent research in soil biogeochemical processes and applications in ecosystem management Organized into three parts the text examines molecular scale processes and critical reactions presents ecosystem scale studies of ecological hotspots and discusses large scale modeling and prediction of global biogeochemical cycles Part of the Wiley IUPAC Series on Biophysico Chemical Processes in Environmental Systems this authoritative volume Provides readers with a systematic and interdisciplinary approach to sustainable agricultural development and management of soil ecosystems in a changing climate Features contributions from an international team of leading scientists Examines topics such as soil organic matter stabilization soil biogeochemistry modeling and soil responses to environmental changes Discusses strategies for mitigating greenhouse gas emission and improving soil health and ecosystems resilience Includes an introduction to working across scales to project soil biogeochemical responses to climatic change Multi Scale Biogeochemical Processes in Soil Ecosystems Critical Reactions and Resilience to Climate Changes is essential reading for scientists engineers agronomists chemists biologists academic researchers consultants and other professionals whose work involves the nutrient cycle ecosystem management and climate change *Marine & Freshwater Research* ,2009 The Characterization and Role of Xylella Fastidiosa Plant Cell Wall Degrading Enzymes and Exopolysaccharide in Pierce's Disease of Grapevine Mary Caroline Roper,2006 *Manipulation and Analysis of Biomolecules, Cells, and Tissues* ,2003 *The Perfect Slime* Hans-Curt Flemming,Dr Thomas R. Neu,Dr Jost Wingender,2016-09-15 The Perfect Slime presents the latest state of knowledge and all aspects of the Extracellular Polymeric Substances EPS matrix from the ecological and health to the antifouling perspectives The book brings together all the current material in order to expand our understanding of the functions properties and characteristics of the matrix as well as the possibilities to strengthen or weaken it The EPS matrix represents the immediate environment in which biofilm organisms live From their point of view this matrix has paramount advantages It allows them to stay together for extended periods and form synergistic microconsortia it retains extracellular enzymes and turns the matrix into an external digestion system and it is a universal recycling yard it protects them against desiccation it allows for intense communication and represents a huge genetic archive They can remodel their matrix break free and eventually they can use it as a nutrient source The EPS matrix can be considered as one of the emergent properties of biofilms and are a major reason for the success of this form of life Nevertheless they have been termed the black matter of biofilms for good reasons First of all the isolation methods define the results In most cases only water soluble EPS components are investigated

insoluble ones such as cellulose or amyloids are much less included In particular in environmental biofilms with many species it is difficult to impossible isolate separate the various EPS molecules they are encased in and to define which species produced which EPS The regulation and the factors which trigger or inhibit EPS production are still very poorly understood Furthermore bacteria are not the only microorganisms to produce EPS Archaea Fungi and algae can also form EPS This book investigates the questions What is their composition function dynamics and regulation What do they all have in common

The Cohesive Strength of Biofilms Eric Hunter Poppele,2006 Characterization of Membrane-aerated Biofilms for Wastewater Treatment Alina Christianson Cole,2005 **Lichenological Contributions in Honour of G.B. Feige** Manfred Jensen,2003 This volume features 42 contributions on the occasion of the 65th birthday of G Benno Feige in 2002 The authors of this volume come from 19 countries which shows its international relevance The articles are distributed to four sections chemicals in lichens new species and phylogeny ecophysiology and morphology distribution and ecology *Manual of Environmental Microbiology* Christon J. Hurst,Ronald L. Crawford,2002 The new second edition of this essential manual summarizes the information and knowledge of environmental microbiology in a single source It details the natural fate of microorganisms in the environment as well as the intentional attempts to eliminate from the environment microorganisms that are pathogenic to humans or to plants and animals The basic principles of environmental microbiology and general analytical methodologies common across the range of the environments covered are presented first The core sections are structured with regard to the type of environmental medium being discussed This landmark effort defines the study of environmental microbiology as we know it today and serve as an essential contribution to the literature **Chemical Abstracts** ,2002 Canadian Journal of Microbiology ,2001 **Bibliotheca lichenologica** ,1973 *In-situ Remediation of MTBE Using Bioaugmentation with Bacterial Strain PM1* Stephanie M. Smith,2004

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