

# Free download Glycoscience and microbial adhesion topics in current chemistry [PDF]

mumtaz virji ins and outs of microbial adhesion martina lahmman architectures of multivalent glycomimetics for probing carbohydrate lectin interactions stefan d knight and julie bouckaert structure function and assembly of type 1 fimbriae knut ohlsen tobias a oelschlaeger jörg hacker a salam khan carbohydrate receptors of bacterial adhesins implications and reflections susann teneberg the multiple carbohydrate binding specificities of helicobacter pylori andrea kristina horst and christoph wagener bitter sweetness of complexity dietrich mack angharad p davies llinos g harris johannes k m knobloch and holger rohde staphylococcus epidermidis biofilms functional molecules relation to virulence and vaccine potential it has been 80 years since the subject of bacterial adhesion to surfaces was first brought forth but only in the last two decades has the importance of this subject been recognized by medical microbiologists the fact that bacterial attachment to the host tissue is a prerequisite for infection understandably led to the hope that infections could be prevented by blocking the adhesion of pathogenic bacteria progress in this field has been so rapid that it has become difficult to keep up with recent developments this book contains the proceedings of the symposium on the molecular mechanisms of microbial adhesion may 6 8 1988 both the symposium and this book were intended as an up to date review of the most recent findings concerning the adhesion of medically important bacteria in addition this book contains critical and provocative overviews of the past present and future of this field this book contains the proceedings of the symposium on microbial adhesion and invasion the meeting was the fifth in a series of symposia initiated and sponsored by the department of biochemistry university of alabama at birmingham we gratefully acknowledge the generous financial support of the following institutions and companies department of biochemistry university of alabama at birmingham birmingham alabama usa national institutes of health bethesda maryland usa alfa laval international ab tumba sweden procter and gamble cincinnati ohio usa amgen inc thousand oaks california usa johnson and johnson new brunswick new jersey usa we would like to express our appreciation to agneta hook timo kostiainen mary homonylo mcgavin martin mcgavin cindy patti joe patti and anna marja saamanen for their time and hard work making this symposium a success and special thanks to kay cooper and wade butcher for help with the management of the symposium and editorial assistance with this book research on bacterial adhesion and its significance is a major field involving many different aspects of nature and human life such as marine science soil and plant ecology most importantly the biomedical field the adhesion of bacteria to the food industry and human tissue surfaces and implanted biomaterial surfaces is an important step in the pathogenesis of infection handbook 0 bacterial adhesion principles methods and applications is an outgrowth of the editors own quest for

information on laboratory techniques for studying bacterial adhesion to biomaterials bone and other tissues and more importantly a response to significant needs in the research community this book is designed to be an experimental guide for biomedical scientists biomaterials scientists students laboratory technicians or anyone who plans to conduct bacterial adhesion studies more specifically it is intended for all those researchers facing the challenge of implant infections in such devices as orthopedic prostheses cardiovascular devices or catheters cerebrospinal fluid shunts or extradural catheters thoracic or abdominal catheters portosystemic shunts or bile stents urological catheters or stents plastic surgical implants oral or maxillofacial implants contraceptive implants or even contact lenses it also covers research methods for the study of bacterial adhesion to tissues such as teeth respiratory mucosa intestinal mucosa and the urinary tract in short it constitutes a handbook for biomechanical and bioengineering researchers and students at all levels study of the phenomena of bacterial adhesion to surfaces has accelerated considerably over the past 10 to 15 years during this period microbiologists have become increasingly aware that attachment to a substratum influences considerably the activities and structures of microbial cells moreover in many cases attached communities of cells have important effects on their substratum and the surrounding environment such phenomena are now known to be important in plant and animal hosts water and soil ecosystems and man made structures and industrial processes much work on microbial adhesion in the early 1970s was descriptive those studies were important for detecting and describing the phenomena of bacterial adhesion to substrata in various environments the findings have been presented in numerous recently published excellent books and reviews in some studies attempts were made to elucidate some fundamental principles controlling adhesion processes in different environments containing a variety of microorganisms common threads have been observed occasionally in different studies taken as a whole however the information has revealed that many disparate factors are involved in adhesion processes whether a particular microorganism can adhere to a certain substratum depends on the properties of the microbial strain itself and on characteristics of the substratum and of the environment attachment to host cells or tissues is often the first step in the establishment of bacterial infections a complex array of recognition attachment and virulence factors is involved in this process which recent research has greatly illuminated this comprehensive and authoritative volume discusses the specific cell and tissue specific affinities of pathogenic microorganisms including bioinorganic surfaces such as teeth and is an essential reference for researchers and students of host pathogen interactions the emergence of pathogens resistant to conventional antimicrobial agents has forced us to intensify the efforts in search for new approaches to prevent infectious diseases such a direction was indicated in studies over the last two decades showing that adhesion of pathogens primarily via glycoconjugate or protein receptors of the host tissue is crucial for the infectious process moreover it was found that infection can be prevented by blocking adhesion of the pathogen to mucosal surfaces of the host the various aspects of interference with the process of microbial adhesion as a way of preventing diseases were the subject of the bat sheva

seminar towards anti adhesion therapy of microbial infectious diseases held in zichron yaakov israel february 25 to march 1 1996 a major aim of the bat sheva de rothschild foundation for the advancement of science in israel which sponsors a series of seminars ours among them is to provide the necessary tools and settings for international forums and exposure of young scientists and promising students to the state of the art of the field this goal has been achieved during the week s discussions and its major aspects are presented in this compendium the seminar s participants as well as the readers of this book thank the founder and foundation for their support this book includes the major themes of this rapidly growing area however by no means do we intend to cover every bit and piece in it the book s first section deals with the lectin sugar interactions and their inhibitors the critically acclaimed laboratory standard for forty years methods in enzymology is one of the most highly respected publications in the field of biochemistry since 1955 each volume has been eagerly awaited frequently consulted and praised by researchers and reviewers alike more than 250 volumes have been published all of them still in print and much of the material is relevant even today truly an essential publication for researchers in all fields of life sciences key features strategies involved in studying adhesion genetic manipulation of adhesions adhesion and receptor isolation and characterization distinguishes between adhesion and invasion assays for adhesion kinetic and epidemiological considerations of adhesion and infection over the last few years bacterial adhesion has become a more and more important and active scientific area but the field lacks communication and scientific exchange between medical and microbiology researchers who work with the relevant biological systems and biochemists structural biologists and physicists who know and understand the physical methods best suited to investigate the phenomenon at the molecular level the field consequently would benefit from a cross disciplinary conference enabling such communication this book tries to bridge the gap between the disciplines the novartis foundation series is a popular collection of the proceedings from novartis foundation symposia in which groups of leading scientists from a range of topics across biology chemistry and medicine assembled to present papers and discuss results the novartis foundation originally known as the ciba foundation is well known to scientists and clinicians around the world over the last few years bacterial adhesion has become a more and more important and active scientific area but the field lacks communication and scientific exchange between medical and microbiology researchers who work with the relevant biological systems and biochemists structural biologists and physicists who know and understand the physical methods best suited to investigate the phenomenon at the molecular level the field consequently would benefit from a cross disciplinary conference enabling such communication this book tries to bridge the gap between the disciplines bacterial adhesion molecular and ecological diversity edited by madilyn fletcher over the last twenty years research has revealed the enormous complexity underlying the phenomenon of bacterial adhesion the initial research goal was to understand the mechanism of attachment and its effects on the bacteria as well as the host as research progressed however it became evident that many different attachment mechanisms exist these diverse

forms of adhesion are the results of numerous evolutionary pressures and each may be part of a larger behavioral strategy. This comprehensive overview details how diversity in habitat and ecological requirements has led to enormous variety in adhesive cell components underlying genetic determinants and behavioral strategies. It presents the latest research on adhesion mechanisms and strategies found in diverse environments and microorganisms including the new environment of biomaterials. Bacterial adhesion molecular and ecological diversity examines adhesion as a strategy for nutrient access and as a phase in the complex behavior of life cycle processes. It covers the latest research and innovative approaches in the field including conceptual advances in research on the adhesion of bacteria to oral surfaces enhancing colonization in a fluctuating environment. The cellulosome, a cell surface organelle for the adhesion to and degradation of cellulose. *Pseudomonas aeruginosa* versatile attachment mechanisms sensing response and adaptation to surfaces. *Myxococcus* coadhesion and role in the life cycle. Edited by a leading authority on bacterial adhesion and featuring contributions from the field's leading experts, this book speaks to researchers in all areas of microbiology, biotechnology, environmental technology and environmental science as well as immunology and infectious diseases. Bacterial adhesion molecular and ecological diversity is the latest addition to the Wiley series in ecological and applied microbiology. Recent books in the series include microbial transformation and degradation of toxic organic chemicals edited by Lily Young and Carl E. Cerniglia, wastewater microbiology by Gabriel Bitton, environmental microbiology edited by Ralph Mitchell, biotechnology in plant disease control edited by Ilan Chet, Antarctic microbiology edited by E. Imre Friedmann, effects of acid rain on forest processes edited by Douglas L. Godbold and Aloys Huttermann. Bacterial carbohydrate recognition are conveyed covering gram positive as well as gram negative bacteria. In chapter 4 streptococci and staphylococci and in chapter 5 carbohydrate binding specificities of *Helicobacter pylori*. In chapter 6 bitter sweetness of complexity the collected reflections on microbial adhesion are expanded by a perspective on a broader impact of glycosylation on cellular adhesion, motility and regulatory processes paralleling the complexity of N-glycan structures on cell surfaces. It highlights particularly how structural details of N-glycans have been causally related to pathological scenarios with a focus on 1,6-N-acetylglucosaminyltransferase. In the final chapter biofilm formation is reviewed covering knowledge about structure and biosynthesis of polysaccharide intercellular adhesins (PIAs) which are central to biofilm formation. This comprehensive chapter explains all PIA-related principles of medical device associated infections. It is our hope that this collection of expert articles ranging from structural chemistry and structural biology to biochemistry and medicine will be a stimulation and motivation for our colleagues in the life sciences. At the same time we hope that these reflections on microbial adhesion will awake interest in and promote understanding of the complex processes associated with the glycocalyx and the multifaceted interactions between the host cell and its guest as well as the biological consequences resulting from this mutual interplay. The phenomenon of adhesion is of cardinal importance in the pharmaceutical, biomedical and dental fields. A few eclectic examples will suffice to underscore the

importance relevance of adhesion in these three areas for example the adhesion between powdered solids is of crucial importance in tablet manufacture the interaction between biodevices e g stents bio implants and body environment dictates the performance of such devices and there is burgeoning research activity in modifying the surfaces of such implements to render them compatible with bodily components in the field of dentistry the modern trend is to shift from retaining of restorative materials by mechanical interlocking to adhesive bonding this unique book addresses all these three areas in an easily accessible single source the book contains 15 chapters written by leading experts and is divided into four parts general topics adhesion in pharmaceutical field adhesion in biomedical field and adhesion in dental field the topics covered include theories or mechanisms of adhesion wettability of powders role of surface free energy in tablet strength and powder flow behavior mucoadhesive polymers for drug delivery systems transdermal patches skin adhesion in long wear cosmetics factors affecting microbial adhesion biofouling and ways to mitigate it adhesion of coatings on surgical tools and bio implants adhesion in fabrication of microarrays in clinical diagnostics antibacterial polymers for dental adhesives and composites evolution of dental adhesives testing of dental adhesives joints new and future developments in microbial biotechnology and bioengineering microbial biofilms is divided into three sections microbial adhesion biofilms in medical settings microbial adhesion biofilms in agriculture and microbial adhesion biofilm in the environment and industry chapters cover adhesion and biofilm formation by pathogenic microbes on tissue and on indwelling medical devices including sections on human infections microbial communication during biofilm mode of growth host defense and antimicrobial resistance and more other sections cover the biofilms of agriculturally important and environmental friendly microbes including biofilm formation on plants in soil and in aquatic environments finally the latest scientific research on microbial adhesion and biofilm formation in the environment and in industry is covered provides an overview on the growth structure cell to cell interactions and control dispersal of bacterial and fungal of in vitro and in vivo biofilms presents an overview on the microbial adhesion biofilm formation and structures of single species and multi species biofilms on human tissues medical devices agriculture environment and chemical industries includes chapters on microbial biofilms of pathogenic microbes on human tissues and in medical indwelling devices covers factors affecting microbial biofilm adhesion and formation an important milestone in the field of microbial adhesion and should be indispensable to all workers in that discipline journal of dispersion science and technology fimbriae are the best studied bacterial colonization factors they are of paramount importance in bacterial pathogenesis and microbial ecology due to the advent of new and powerful techniques an impressive amount of information has been accumulated on these important surface organelles over the last decade the first book of its kind fimbriae brings together into one volume the state of the art of this very active field internationally recognized researchers give both a horizontal and lateral approach to fimbriology selected types of fimbriae are extensively reviewed and fundamental questions such as evolution control or regulation biogenesis bacteria host interaction and fimbriae based vaccines are

examined since the fitting surface of the denture base promotes colonization of micro organisms it is important to know how the different types of denture base prevent or promote the colonization of micro organisms this study aimed to compare the adhesion of micro organisms to the fitting surface of acetal resin metallic removable partial denture rpd bases and mucosa beneath them using the same environmental condition in patient class iii mod 1 kennedy classification this comprehensive edited book on microbial prospective discusses the innovative approaches and investigation strategies as well as provides a broad spectrum of the cutting edge research on the processing properties and technological developments of microbial products and their applications microbes finds very important applications in our lives including industries and food processing they are widely used in the fermentation of beverages processing of dairy products production of pharmaceuticals chemicals enzymes proteins and biomaterials conversion of biomass into fuel fuel cell technology health and environmental sectors some of these products are produced commercially while others are potentially valuable in biotechnology microorganisms are considered invaluable in research as model organisms this is a useful compilation for students and researchers in microbiology biotechnology and chemical industries biofilms science and technology covers the main topics of biofilm formation and activity from basic science to applied aspects in engineering and medicine the book presents a masterly discussion of microbial adhesion the metabolism of microorganisms in biofilms modelling of mass transfer and biological reaction within biofilms as well as the behaviour of these microbial communities in industry waste water treatment heat exchanger biofouling membranes food processing and in medicine teeth implants prosthetic devices laboratory techniques and industrial monitoring methods are also presented the book is directed at readers at the postgraduate level and is organised as a textbook containing 11 chapters a glossary and a detailed subject index 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 this book documents the proceedings of the second international symposium on acid base interactions relevance to adhesion science and technology held in newark new jersey october 19 21 1998 since the first symposium on this topic was held on the occasion of the 75th birthday of professor frederick m fowkes in 1990 it was deemed opportune and necessary to hold the second symposium on this topic this symposium was organized with the following objectives in mind i to consolidate the r d activity carried out since the first symposium ii to provide a forum for discussion of

latest research results iii to provide an opportunity for cross pollination of ideas iv to identify topics where there was discordance of opinion or discrepancy and v to highlight areas which needed intensified research activities the final technical program contained a total of 36 papers by researchers and technologists from academia industry and other organizations this book contains a total of 32 papers which were rigorously peer reviewed and suitably revised before inclusion in this book the book is divided into three parts as follows part 1 fundamental aspects of acid base interactions part 2 characterization of the acid base properties of materials and part 3 applications of acid base interactions the topics covered include surface free energy acid base theory applied to solid surfaces good van oss and chaudhury theory contact angle measurements and interpretation acid base theory of contact angles acid base strength of solid surfaces acid base interactions at solid surfaces acid base interactions at the molecular level characterization of acid base properties of a host of materials polymers wood glass ceramics silica particles textile fibers rocks by xps inverse gas chromatography immersion calorimetry contact angle titration and thin layer wicking and relevance of acid base interactions to bioadhesion microbial adhesion polymer adhesion and adhesion in reinforced polymer composites abstract this study aimed to evaluate the in vivo initial microbial adhesion of oral microorganisms on the biomaterial biodentine compared to mta and ah plus cylindrical samples of the materials were prepared and dentin slabs served as a control an individual intraoral lower jaw splint served as a carrier for the samples and was worn by six volunteers the specimens were worn for 120 min adherent bacteria were quantified by determining the colony forming units cfus while the visualization and quantification of total adherent microorganisms were facilitated by using dapi and live dead staining combined with fluorescence microscopy bovine dentin had a significantly higher number of aerobic cfus compared to biodentine  $p = 0.017$  and mta  $p = 0.013$  the lowest amounts of dapi stained adherent microorganisms were quantified for biodentine 15.9 and the control 18.9 while mta showed the highest counts of initially adherent microorganisms 38.10 significant differences were found for mta and biodentine  $p = 0.004$  as well as for mta and the control  $p = 0.021$  and for ah plus and the control  $p = 0.025$  biodentine inhibited microbial adherence thereby yielding an antimicrobial effectivity similar to that of mta offers a detailed introduction to the fundamental phenomena that govern cell adhesion and describes bioengineering processes that employ cell adhesion focusing on both biochemical and biomedical applications all industrially relevant issues of cell adhesion from basic concepts quantitative experiments and mathematical models to applications in bioreactors and other process equipment are examined physiological models in microbiology consists of two volumes volume i considers models of basic growth processes and the effects of environmental factors on microbial growth volume ii describes models of secondary processes in particular microbial death spore germination chemotaxis and surface growth

## ***Glycoscience and Microbial Adhesion 2009-05-30***

mumtaz virji ins and outs of microbial adhesion martina lahmann architectures of multivalent glycomimetics for probing carbohydrate lectin interactions stefan d knight and julie bouckaert structure function and assembly of type 1 fimbriae knut ohlsen tobias a oelschlaeger jörg hacker a salam khan carbohydrate receptors of bacterial adhesins implications and reflections susann teneberg the multiple carbohydrate binding specificities of helicobacter pylori andrea kristina horst and christoph wagener bitter sweetness of complexity dietrich mack angharad p davies llinos g harris johannes k m knobloch and holger rohde staphylococcus epidermidis biofilms functional molecules relation to virulence and vaccine potential

## **Molecular Mechanisms of Microbial Adhesion 2012-12-06**

it has been 80 years since the subject of bacterial adhesion to surfaces was first brought forth but only in the last two decades has the importance of this subject been recognized by medical microbiologists the fact that bacterial attachment to the host tissue is a prerequisite for infection understandably led to the hope that infections could be prevented by blocking the adhesion of pathogenic bacteria progress in this field has been so rapid that it has become difficult to keep up with recent developments this book contains the proceedings of the symposium on the molecular mechanisms of microbial adhesion may 6 8 1988 both the symposium and this book were intended as an up to date review of the most recent findings concerning the adhesion of medically important bacteria in addition this book contains critical and provocative overviews of the past present and future of this field

## **Microbial Adhesion and Aggregation 2012-12-06**

this book contains the proceedings of the symposium on microbial adhesion and invasion the meeting was the fifth in a series of symposia initiated and sponsored by the department of biochemistry university of alabama at birmingham we gratefully acknowledge the generous financial support of the following institutions and companies department of biochemistry university of alabama at birmingham birmingham alabama usa national institutes of health Bethesda Maryland USA alfa laval international AB Tumba Sweden procter and gamble Cincinnati Ohio USA amgen inc Thousand Oaks California USA Johnson and Johnson New Brunswick New Jersey USA we would like to express our appreciation to agneta hook timo kostiainen mary homonylo mcgavin martin mcgavin cindy patti joe patti and anna marja saamanen for their time and hard work making this symposium a success and special thanks to kay cooper and wade butcher for help with the management of the symposium and editorial assistance with this book



## **Microbial Adhesion to Surfaces 1980**

research on bacterial adhesion and its significance is a major field involving many different aspects of nature and human life such as marine science soil and plant ecology most importantly the biomedical field the adhesion of bacteria to the food industry and human tissue surfaces and implanted biomaterial surfaces is an important step in the pathogenesis of infection handbook of bacterial adhesion principles methods and applications is an outgrowth of the editors own quest for information on laboratory techniques for studying bacterial adhesion to biomaterials bone and other tissues and more importantly a response to significant needs in the research community this book is designed to be an experimental guide for biomedical scientists biomaterials scientists students laboratory technicians or anyone who plans to conduct bacterial adhesion studies more specifically it is intended for all those researchers facing the challenge of implant infections in such devices as orthopedic prostheses cardiovascular devices or catheters cerebrospinal fluid shunts or extradural catheters thoracic or abdominal catheters portosystemic shunts or bile stents urological catheters or stents plastic surgical implants oral or maxillofacial implants contraceptive implants or even contact lenses it also covers research methods for the study of bacterial adhesion to tissues such as teeth respiratory mucosa intestinal mucosa and the urinary tract in short it constitutes a handbook for biomechanical and bioengineering researchers and students at all levels

## **Microbial Adhesion and Invasion 2012-12-06**

study of the phenomena of bacterial adhesion to surfaces has accelerated considerably over the past 10 to 15 years during this period microbiologists have become increasingly aware that attachment to a substratum influences considerably the activities and structures of microbial cells moreover in many cases attached communities of cells have important effects on their substratum and the surrounding environment such phenomena are now known to be important in plant and animal hosts water and soil ecosystems and man made structures and industrial processes much work on microbial adhesion in the early 1970s was descriptive those studies were important for detecting and describing the phenomena of bacterial adhesion to substrata in various environments the findings have been presented in numerous recently published excellent books and reviews in some studies attempts were made to elucidate some fundamental principles controlling adhesion processes in different environments containing a variety of microorganisms common threads have been observed occasionally in different studies taken as a whole however the information has revealed that many disparate factors are involved in adhesion processes whether a particular microorganism can adhere to a certain substratum depends on the properties of the microbial strain itself and on characteristics of the substratum and of the environment

## **Handbook of Bacterial Adhesion 2000-01-21**

attachment to host cells or tissues is often the first step in the establishment of bacterial infections a complex array of recognition attachment and virulence factors is involved in this process which recent research has greatly illuminated this comprehensive and authoritative volume discusses the specific cell and tissue specific affinities of pathogenic microorganisms including bioinorganic surfaces such as teeth and is an essential reference for researchers and students of host pathogen interactions

## **Bacterial Adhesion 2013-11-11**

the emergence of pathogens resistant to conventional antimicrobial agents has forced us to intensify the efforts in search for new approaches to prevent infectious diseases such a direction was indicated in studies over the last two decades showing that adhesion of pathogens primarily via glycoconjugate or protein receptors of the host tissue is crucial for the infectious process moreover it was found that infection can be prevented by blocking adhesion of the pathogen to mucosal surfaces of the host the various aspects of interference with the process of microbial adhesion as a way of preventing diseases were the subject of the bat sheva seminar towards anti adhesion therapy of microbial infectious diseases held in zichron yaakov israel february 25 to march 1 1996 a major aim of the bat sheva de rothschild foundation for the advancement of science in israel which sponsors a series of seminars ours among them is to provide the necessary tools and settings for international forums and exposure of young scientists and promising students to the state of the art of the field this goal has been achieved during the week s discussions and its major aspects are presented in this compendium the seminar s participants as well as the readers of this book thank the founder and foundation for their support this book includes the major themes of this rapidly growing area however by no means do we intend to cover every bit and piece in it the book s first section deals with the lectin sugar interactions and their inhibitors

## **Microbial Adhesion to Surfaces 1980**

the critically acclaimed laboratory standard for forty years methods in enzymology is one of the most highly respected publications in the field of biochemistry since 1955 each volume has been eagerly awaited frequently consulted and praised by researchers and reviewers alike more than 250 volumes have been published all of them still in print and much of the material is relevant even today truly an essential publication for researchers in all fields of life sciences key features strategies involved in studying adhesion genetic manipulation of adhesions adhesion and receptor isolation and characterization

distinguishes between adhesion and invasion assays for adhesion kinetic and epidemiological considerations of adhesion and infection

## **Bacterial Adhesion to Cells and Tissues 2012-12-06**

over the last few years bacterial adhesion has become a more and more important and active scientific area but the field lacks communication and scientific exchange between medical and microbiology researchers who work with the relevant biological systems and biochemists structural biologists and physicists who know and understand the physical methods best suited to investigate the phenomenon at the molecular level the field consequently would benefit from a cross disciplinary conference enabling such communication this book tries to bridge the gap between the disciplines

## **Microbial Adhesion and Aggregation 2012-12-06**

the novartis foundation series is a popular collection of the proceedings from novartis foundation symposia in which groups of leading scientists from a range of topics across biology chemistry and medicine assembled to present papers and discuss results the novartis foundation originally known as the ciba foundation is well known to scientists and clinicians around the world

## **Toward Anti-Adhesion Therapy for Microbial Diseases 1995-07-11**

over the last few years bacterial adhesion has become a more and more important and active scientific area but the field lacks communication and scientific exchange between medical and microbiology researchers who work with the relevant biological systems and biochemists structural biologists and physicists who know and understand the physical methods best suited to investigate the phenomenon at the molecular level the field consequently would benefit from a cross disciplinary conference enabling such communication this book tries to bridge the gap between the disciplines

## **Adhesion of Microbial Pathogens 1985**

bacterial adhesion molecular and ecological diversity edited by madilyn fletcher over the last twenty years research has revealed the enormous complexity underlying the phenomenon of bacterial adhesion the initial research goal was to understand the mechanism of attachment and its effects on the bacteria as well as the host as research progressed however it became evident that many different attachment mechanisms exist these

diverse forms of adhesion are the results of numerous evolutionary pressures and each may be part of a larger behavioral strategy. This comprehensive overview details how diversity in habitat and ecological requirements has led to enormous variety in adhesive cell components underlying genetic determinants and behavioral strategies. It presents the latest research on adhesion mechanisms and strategies found in diverse environments and microorganisms including the new environment of biomaterials. Bacterial adhesion molecular and ecological diversity examines adhesion as a strategy for nutrient access and as a phase in the complex behavior of life cycle processes. It covers the latest research and innovative approaches in the field including conceptual advances in research on the adhesion of bacteria to oral surfaces enhancing colonization in a fluctuating environment. The cellulosome, a cell surface organelle for the adhesion to and degradation of cellulose. *Pseudomonas aeruginosa*: versatile attachment mechanisms, sensing response and adaptation to surfaces. *Myxococcus*: coadhesion and role in the life cycle. Edited by a leading authority on bacterial adhesion and featuring contributions from the field's leading experts, this book speaks to researchers in all areas of microbiology, biotechnology, environmental technology and environmental science as well as urology, immunology and infectious diseases. Bacterial adhesion molecular and ecological diversity is the latest addition to the Wiley series in ecological and applied microbiology. Recent books in the series include microbial transformation and degradation of toxic organic chemicals edited by Lily Y. Young and Carl E. Cerniglia, wastewater microbiology by Gabriel Bitton, environmental microbiology edited by Ralph Mitchell, biotechnology in plant disease control edited by Ilan Chet, Antarctic microbiology edited by E. Imre Friedmann, effects of acid rain on forest processes edited by Douglas L. Godbold and Aloys Huttermann.

## **Bacterial Adhesion 2011-05-10**

Bacterial carbohydrate recognition are conveyed covering gram positive as well as gram negative bacteria in chapter 4. Streptococci and staphylococci and in chapter 5 carbohydrate binding specificities of *Helicobacter pylori* in chapter 6. Bitter sweetness of complexity: the collected reflections on microbial adhesion are expanded by a perspective on a broader impact of glycosylation on cellular adhesion, motility and regulatory processes paralleling the complexity of N-glycan structures on cell surfaces. It highlights particularly how structural details of N-glycans have been causally related to pathological scenarios with a focus on 1,6-N-acetylglucosaminyltransferase. In the final chapter, biofilm formation is reviewed covering knowledge about structure and biosynthesis of polysaccharide intercellular adhesins (PIAs) which are central to biofilm formation. This comprehensive chapter explains all PIA-related principles of medical device-associated infections. It is our hope that this collection of expert articles ranging from structural chemistry and structural biology to biochemistry and medicine will be a stimulation and motivation for our colleagues in the life sciences. At the same time we hope that these reflections on microbial adhesion will awake interest in and promote understanding of the complex processes associated with the glycocalyx and the

multifaceted interactions between the host cell and its guest as well as the biological consequences resulting from this mutual interplay

## ***Bacterial Adhesion 2009-09-14***

the phenomenon of adhesion is of cardinal importance in the pharmaceutical biomedical and dental fields a few eclectic examples will suffice to underscore the importance relevance of adhesion in these three areas for example the adhesion between powdered solids is of crucial importance in tablet manufacture the interaction between biodevices e.g. stents bio implants and body environment dictates the performance of such devices and there is burgeoning research activity in modifying the surfaces of such implements to render them compatible with bodily components in the field of dentistry the modern trend is to shift from retaining of restorative materials by mechanical interlocking to adhesive bonding this unique book addresses all these three areas in an easily accessible single source the book contains 15 chapters written by leading experts and is divided into four parts general topics adhesion in pharmaceutical field adhesion in biomedical field and adhesion in dental field the topics covered include theories or mechanisms of adhesion wettability of powders role of surface free energy in tablet strength and powder flow behavior mucoadhesive polymers for drug delivery systems transdermal patches skin adhesion in long wear cosmetics factors affecting microbial adhesion biofouling and ways to mitigate it adhesion of coatings on surgical tools and bio implants adhesion in fabrication of microarrays in clinical diagnostics antibacterial polymers for dental adhesives and composites evolution of dental adhesives testing of dental adhesives joints

## **Adhesion and Microorganism Pathogenicity 1985**

new and future developments in microbial biotechnology and bioengineering microbial biofilms is divided into three sections microbial adhesion biofilms in medical settings microbial adhesion biofilms in agriculture and microbial adhesion biofilm in the environment and industry chapters cover adhesion and biofilm formation by pathogenic microbes on tissue and on indwelling medical devices including sections on human infections microbial communication during biofilm mode of growth host defense and antimicrobial resistance and more other sections cover the biofilms of agriculturally important and environmental friendly microbes including biofilm formation on plants in soil and in aquatic environments finally the latest scientific research on microbial adhesion and biofilm formation in the environment and in industry is covered provides an overview on the growth structure cell to cell interactions and control dispersal of bacterial and fungal of in vitro and in vivo biofilms presents an overview on the microbial adhesion biofilm formation and structures of single species and multi species biofilms on human tissues medical

devices agriculture environment and chemical industries includes chapters on microbial biofilms of pathogenic microbes on human tissues and in medical indwelling devices covers factors affecting microbial biofilm adhesion and formation

## **Molecular Basis of Oral Microbial Adhesion 1989-01-01**

an important milestone in the field of microbial adhesion and should be indispensable to all workers in that discipline journal of dispersion science and technology

## **Molecular Basis of Oral Microbial Adhesion 2003**

fimbriae are the best studied bacterial colonization factors they are of paramount importance in bacterial pathogenesis and microbial ecology due to the advent of new and powerful techniques an impressive amount of information has been accumulated on these important surface organelles over the last decade the first book of its kind fimbriae brings together into one volume the state of the art of this very active field internationally recognized researchers give both a horizontal and lateral approach to fimbriology selected types of fimbriae are extensively reviewed and fundamental questions such as evolution control or regulation biogenesis bacteria host interaction and fimbriae based vaccines are examined

## **Molecular Mechanisms of Microbial Adhesion 2011-05-26**

since the fitting surface of the denture base promotes colonization of micro organisms it is important to know how the different types of denture base prevent or promote the colonization of micro organisms this study aimed to compare the adhesion of micro organisms to the fitting surface of acetal resin metallic removable partial denture rpd bases and mucosa beneath them using the same environmental condition in patient class iii mod 1 kennedy classification

## ***Bacterial Adhesion to Animal Cells and Tissues 1996-09-21***

this comprehensive edited book on microbial prospective discusses the innovative approaches and investigation strategies as well as provides a broad spectrum of the cutting edge research on the processing properties and technological developments of microbial products and their applications microbes finds very important applications in our lives including industries and food processing they are widely used in the fermentation of beverages processing of dairy products production of pharmaceuticals chemicals

enzymes proteins and biomaterials conversion of biomass into fuel fuel cell technology health and environmental sectors some of these products are produced commercially while others are potentially valuable in biotechnology microorganisms are considered invaluable in research as model organisms this is a useful compilation for students and researchers in microbiology biotechnology and chemical industries

## **Bacterial Adhesion 2009-06-23**

biofilms science and technology covers the main topics of biofilm formation and activity from basic science to applied aspects in engineering and medicine the book presents a masterly discussion of microbial adhesion the metabolism of microorganisms in biofilms modelling of mass transfer and biological reaction within biofilms as well as the behaviour of these microbial communities in industry waste water treatment heat exchanger biofouling membranes food processing and in medicine teeth implants prosthetic devices laboratory techniques and industrial monitoring methods are also presented the book is directed at readers at the postgraduate level and is organised as a textbook containing 11 chapters a glossary and a detailed subject index

## **Bacterial Adhesion 2017-06-15**

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

## **Glycoscience and Microbial Adhesion 1979**

this book documents the proceedings of the second international symposium on acid base interactions relevance to adhesion science and technology held in newark new jersey october 19 21 1998 since the first symposium on this topic was held on the occasion of the 75th birthday of professor frederick m fowkes in 1990 it was deemed opportune and necessary to hold the second symposium on this topic this symposium was organized with the following objectives in mind i to consolidate the r d activity carried out since the



first symposium ii to provide a forum for discussion of latest research results iii to provide an opportunity for cross pollination of ideas iv to identify topics where there was discordance of opinion or discrepancy and v to highlight areas which needed intensified r d activities the final technical program contained a total of 36 papers by researchers and technologists from academia industry and other organizations this book contains a total of 32 papers which were rigorously peer reviewed and suitably revised before inclusion in this book the book is divided into three parts as follows part 1 fundamental aspects of acid base interactions part 2 characterization of the acid base properties of materials and part 3 applications of acid base interactions the topics covered include surface free energy acid base theory applied to solid surfaces good van oss and chaudhury theory contact angle measurements and interpretation acid base theory of contact angles acid base strength of solid surfaces acid base interactions at solid surfaces acid base interactions at the molecular level characterization of acid base properties of a host of materials polymers wood glass ceramics silica particles textile fibers rocks by xps inverse gas chromatography immersion calorimetry contact angle titration and thin layer wicking and relevance of acid base interactions to bioadhesion microbial adhesion polymer adhesion and adhesion in reinforced polymer composites

## **Adhesion in Pharmaceutical, Biomedical, and Dental Fields 2019-10-10**

abstract this study aimed to evaluate the in vivo initial microbial adhesion of oral microorganisms on the biomaterial biodentine compared to mta and ah plus cylindrical samples of the materials were prepared and dentin slabs served as a control an individual intraoral lower jaw splint served as a carrier for the samples and was worn by six volunteers the specimens were worn for 120 min adherent bacteria were quantified by determining the colony forming units cfus while the visualization and quantification of total adherent microorganisms were facilitated by using dapi and live dead staining combined with fluorescence microscopy bovine dentin had a significantly higher number of aerobic cfus compared to biodentine  $p = 0.017$  and mta  $p = 0.013$  the lowest amounts of dapi stained adherent microorganisms were quantified for biodentine 15.9 and the control 18.9 while mta showed the highest counts of initially adherent microorganisms 38.10 significant differences were found for mta and biodentine  $p = 0.004$  as well as for mta and the control  $p = 0.021$  and for ah plus and the control  $p = 0.025$  biodentine inhibited microbial adherence thereby yielding an antimicrobial effectivity similar to that of mta

## **Adhesion of Microorganisms to Surfaces 1990**

offers a detailed introduction to the fundamental phenomena that govern cell adhesion and describes bioengineering processes that employ cell adhesion focusing on both biochemical and biomedical



applications all industrially relevant issues of cell adhesion from basic concepts quantitative experiments and mathematical models to applications in bioreactors and other process equipment are examined

## **New and Future Developments in Microbial Biotechnology and Bioengineering: Microbial Biofilms 2007**

physiological models in microbiology consists of two volumes volume i considers models of basic growth processes and the effects of environmental factors on microbial growth volume ii describes models of secondary processes in particular microbial death spore germination chemotaxis and surface growth

## ***Microbial Cell Surface Hydrophobicity 2020-11-25***

## ***Microbial Adhesion Mechanisms in Reverse Osmosis and Nanofiltration 1980***

## **Fimbriae Adhesion, Genetics, Biogenesis, and Vaccines 2012-07**

## **Adsorption of Microorganisms to Surfaces 2022-01-03**

## **Comparison of the Microbial Adhesion to Acetal Resin and Metallic RPD 2012-12-06**

## **Application of Microbes in Environmental and Microbial Biotechnology**

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***Biofilms - Science and Technology 2003***

**Microbial Extracellular Polymeric Substances 1999**

**Adhesion of Oral Microbes to Dental Fiber Reinforced Composites  
2000-09-28**

**Computer Aided Research in Microbial and Particle Adhesion 2023**

**Acid-Base Interactions: Relevance to Adhesion Science and Technology  
2018-10-03**

***Biodentine Inhibits the Initial Microbial Adhesion of Oral Microbiota  
in Vivo 2018-02-01***

***Cell Adhesion in Bioprocessing and Biotechnology 1986-04-17***

**Physiological Models in Microbiology**

## ***Adhesion and Microorganism Pathogenicity - Symposium***

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