

Systems Biology Of Clostridium

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systems biology of clostridium provides a comprehensive overview of system biology approaches in clostridia especially clostridium acetobutylicum systems biology is a rapidly evolving scientific discipline that allows us to understand and predict the metabolism and its changes within the bacterium as a whole clostridia represent one of the largest bacterial genera this group contains organisms with metabolic properties that hold enormous potential for biotechnological processes a model organism is clostridium acetobutylicum that has been and is still used in large scale industrial production of the solvents acetone and butanol systems biology offers a new way to elucidate and understand the complex regulatory network controlling the different metabolic pathways and their interactions all aspects from the development of appropriate experimental tools to mathematical modeling are covered including a fascinating historical account on acetone butanol fermentation in world war ii written by world class experts in their fields systems biology of clostridium is an essential source of reference for all biologists biochemists chemists and chemical engineers working on biotechnological fermentations or industrial applications as well as biofuels

the clostridia are a group of bacteria of considerable medical and economic importance and include species responsible for generating the most potent toxins known to humans the clostridia molecular biology and pathogenesis is a unique work comprising the most complete reference on the clostridia for over 20 years bringing together the results from some of the most innovative and exciting research in the past decade using a principle oriented rather than taxonomic approach the results from molecular biology research are placed in the context of their clinical significance and the disease process as a whole this state of the art work is truly comprehensive covering and integrating the diverse topics of genetics physiology pathogenesis and cell biology written and edited by world renowned authorities material is presented to give the reader an up to date knowledge of the pathogenic species of this important genus background information is followed by details of

the genetics molecular biology biochemistry and disease mechanisms the structure function and mode of action of toxins and other virulence determinants is clearly presented as such this work will prove essential for students teachers research microbiologists infectious disease clinicians toxin specialists and all those working in medical or veterinary bacteriology microbial genetics and the pharmaceutical industries covers appropriate medical and veterinary topics contains authoritative contributions by international experts presents the current state of knowledge and areas for future research truly comprehensive covers topics from molecular biology and physiology

clostridium difficile has been recognized as the cause of a broad spectrum of enteric disease ranging from mild antibiotic associated diarrhea to pseudomembranous colitis this volume gives new insights into the microbiology diagnostics and epidemiology of clostridium difficile and describes recent strategies in treatment of diseases caused by this agent main parts of the volume are devoted to clostridium difficile toxins a and b which are the major virulence factors the molecular biology biochemistry pharmacology and cell biology of these toxins which are the prototypes of a new family of large clostridial cytotoxins is described in great detail clostridium difficile toxins act as glucosyltransferases to inactivate small gtp binding proteins of the rho family which are involved in regulation of the actin cytoskeleton cell adhesion and various signaling processes

clostridium difficile a major nosocomial pathogen shown to be a primary cause of antibiotic associated disease has emerged as a highly transmissible and frequently antibiotic resistant organism causing a considerable burden on health care systems worldwide in clostridium difficile methods and protocols expert researchers bring together the most recently developed methods for studying the organism including techniques involving isolation molecular typing genomics genetic manipulation and the use of animal models written in the highly successful methods in molecular biologytm series format chapters include brief introductions to their respective topics lists of the necessary materials and reagents step by step readily reproducible laboratory protocols and notes highlighting tips on troubleshooting

and avoiding known pitfalls authoritative and cutting edge clostridium difficile methods and protocols serves as an ideal guide for scientists now in a position to gain an in depth understanding of how this organism is transmitted and how it causes disease

the papers which are collected in this volume of contributions have been written by officers or students in the department of biology of brown university and have recently appeared in various scientific journals in the table of contents and on the title page of each paper will be found the place and time of publication

in this book internationally recognised clostridium experts critically review the most important aspects of clostridial research providing the first coherent picture of the organism s molecular and cellular biology in this post genomic era the first major focus of the book is the genetics and molecular biology of the major clostridial toxins including botulinum and tetanus neurotoxins c difficile large exotoxins c perfringens enterotoxin pore forming and binary bacterial toxins other topics include molecular epidemiology of c botulinum and c difficile metabolic networks in c acet

includes scientific proceedings of the society of american bacteriologists

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the field of bacterial genetics has been restricted for many years to *Escherichia coli* and a few other genera of aerobic or facultatively anaerobic bacteria such as *Pseudomonas*, *Bacillus* and *Salmonella*. The prevailing view up to recent times has been that anaerobic bacteria are interesting organisms but nothing is known about their genetics. To most microbiologists anaerobic bacteria appeared as a sort of distant domain reserved for occasional intrusions by taxonomists and medical microbiologists. By the mid 1970s knowledge of the genetics and molecular biology of anaerobes began to emerge and then developed rapidly but also in this was the result of advances in molecular biology techniques. Importantly because of improvements in basic techniques for culturing anaerobes and for understanding their biochemistry and other areas of interest investigations in this field were also stimulated by a renewal of interest in their ecology, their role in pathology and in biotransformations and in the search for alternative renewable sources of energy. The initial idea for this book came from Thomas D Brock when Dr Brock requested my opinion about two years ago on the feasibility of publishing a book on the genetics of anaerobic bacteria as a part of the Brock Springer series in contemporary bioscience. I answered positively but I was apprehensive about assuming the role of editor. However I was soon reassured by the enthusiastic commitment of those I approached to contribute. Eventually thanks to the caring cooperation of the contributors the task became relatively easy.

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