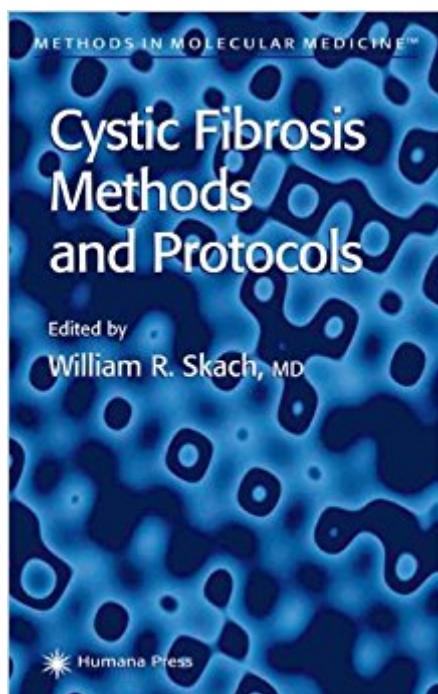


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Cystic Fibrosis Methods And Protocols (Methods In Molecular Medicine)



Synopsis

Since the cloning of the cystic fibrosis transmembrane conductance re- lator (CFTR) nearly a decade ago, cystic fibrosis (CF) research has witnessed a dramatic expansion into new scientific areas. Basic researchers, clinicians, and patients increasingly rely on fundamental techniques of genetics, molecular biology, electrophysiology, biochemistry, cell biology, microbiology, and immunology to understand the molecular basis of this complex disease. Research into the pathophysiology of CF has established numerous paradigms of ion channel dysfunction that extend from inflammation and infection in the airways of patients to basic mechanisms of protein processing and regulation in intracellular components. With these rapid advances has come an increasing need for research scientists to understand and utilize a growing array of basic laboratory tools. This volume of *Methods in Molecular Medicine, Cystic Fibrosis Methods and Protocols* satisfies that need by providing detailed protocols for the laboratory techniques used throughout CF research. From electrophysiology and cell biology, to animal models and gene therapy, the comprehensive set of methods covered here provide step-by-step instructions needed for investigators to incorporate new approaches into their research programs. Contributions have been chosen to reflect the rich diversity of techniques and to provide a cohesive framework for understanding challenges that are currently at the forefront of CF research. It is hoped that this volume will serve as a valuable reference that will not only foster interdisciplinary investigations into current problems encountered in CF, but also facilitate the translation of new scientific discoveries into clinical solutions.

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"The coverage of methodologies is extremely broad and will be useful for those wanting to find out more about some of the less routine techniques used in the analysis of the CFTR protein/chloride channel. The style of protocol-based chapters enables in manuscripts due to considerations of space or potential repetition of previously published techniques. As such many of the chapters are valuable." -Molecular Biotechnology "Undoubtedly this book will be regarded as essential reading for scientists in the field. It provides details of research methodology, which are rarely published in peer reviewed journals. It will also enable researchers to identify subtle differences in techniques in their own laboratories from those described in these chapters. As such, it will be a very important book for all those who conduct laboratory-based research into cystic fibrosis." -Journal of Paediatrics and Child Health

Since the cloning of the cystic fibrosis transmembrane conductance regulator (CFTR) nearly a decade ago, cystic fibrosis researchers, clinicians, and patients have come to rely increasingly on a diverse array of fundamental techniques to understand the molecular basis of this complex disease. Cystic Fibrosis Methods and Protocols consolidates a broad range of detailed and readily reproducible *in vitro*, cellular, and whole animal laboratory protocols into an indispensable resource. From electrophysiology and cell biology, to animal models and gene therapy, this comprehensive set of methods provides the step-by-step instructions needed for investigators to incorporate new approaches into their research programs. Specific protocols describe new techniques for diagnosis, *in vitro* methods for the expression and functional analysis of CFTR, novel biochemical and cellular systems to determine how mutations subvert CFTR function, and *in vivo* protocols to examine how CFTR dysfunction produces multisystem pathology in human and animal models. Comprehensive, multidisciplinary, and highly practical, Cystic Fibrosis Methods and Protocols makes accessible to today's cystic fibrosis investigator the powerful new scientific techniques required to investigate the basic science of the disease and to translate this into effective clinical solutions.

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