

BOOK REVIEWS

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Molecular Biology of Picornaviruses

ASM (American Society for Microbiology) Press: Washington, D. C., 2002. XVII + 502 pages.
Format 215 x 279 mm. Hardcover. Price USD 189.95. ISBN 1-55581-210-4

The editors are affiliated with the University of California, Irvine and the State University of New York at Stony Brook. The list of contributors embraces 108 international experts from USA, Canada, Europe and Japan. As declared in the preface by the editors, research on picornaviruses has yielded numerous landmark discoveries, often with an impact on virology and even biology in general. Numerous remarkable studies have placed picornavirus research at the forefront of discovery in molecular virology. However, many the precise details of molecular events remain to be elucidated. Considering that human picornaviruses alone cause an estimated 6 billion infections per year, inflicting misery, debilitation, and even death, these viruses will remain a challenge to humankind.

The volume is composed of 12 sections divided into 39 numbered chapters. Particular chapters represent full scientific communications including figures, tables and a list of references.

Introductory section 1 describes the history of poliomyelitis and its research. Poliomyelitis, in all probability, is an infection associated with mankind since ancient times. This assumption is based on biomedical considerations, and on case descriptions in history. A well-known example is that of the doorkeeper "Ram", 18th Egyptian dynasty (1550–1333 B. C.), exhibiting on a stela a "pes equinus" and an atrophic right leg, possible consequence of a previous poliovirus infection.

Sections 2 through 5, containing 11 chapters, give insights into taxonomy, virion structure, virus entry and viral genomes. Picornaviruses are a large and complex family. A rational basis for taxonomy has provided an increasing molecular information establishing genuine relationships between members. The three-dimensional, near atomic resolution structure of rhino-, entero- (polio- and coxsackie-), parecho-, and cardioviruses have been determined by X-ray crystallography. Structures have also been determined by cryo-electron microscopy. Looked at are different virion capsids structures, the viral proteins, interaction with viral receptors, antibody interactions with *Rhinovirus*, and antigenic variation in foot-and-mouth disease virus (FMDV). In the complex of chapters on virus entry diverse aspects of virus receptors are examined.

Sections 6 through 9, embracing 16 chapters, give attention to the initiation of translation, proteolytic processing, viral RNA replication, and to shutoff of host cell translation and transcription. Analysed are picornavirus structure and function of the internal

ribosome entry site, proteins involved in ribosomal entry sites, cleavage products of polyproteins, proteinases, genome replication, RNA polymerases, proteinase-mediated shutoff of host cell translation, effects of proteinases on host cell transcription, and effects of viral replication on cellular membrane metabolism and function.

Section 10 consisting of 8 chapters moves into the area of pathogenicity. Outlined are: clinical significance, diagnosis and treatment of picornavirus infections, determinants of poliovirus pathogenesis, immunology and pathogenesis of coxsackieviruses, hepatitis A virus pathogenesis and attenuation, pathogenesis of Theiler's murine encephalomyelitis virus-induced disease, and persistent infections to picornaviruses.

Section 11, constituting 2 chapters, deals with cell-free genetics of poliovirus and poliovirus RNA replication and genetic complementation in cell-free reactions.

Concluding section 12, composed of 2 chapters, provides presentation of global eradication of poliovirus: history and rationale, and elucidates the mechanisms of poliovirus eradication.

Each chapter is supplemented with a most comprehensive list of references covering up to about 200–300 citations. The volume is illustrated by numerous figures (numbered by individual chapters) and XXIV full-page colour plates composed of schematic line drawings, different diagrammatic representations, types of representations possible with "roadmaps", electron microscopy photographs and image reconstructions, confocal laser scanning micrographs, space-filling models, architecture of viruses, crystal and molecular structures, biochemical processes, schemes of genetic analyses, genetic maps, schematic representations of viral genomes, geographical maps, results of laboratory analyses, etc.

The field of picornavirus research has exploded over the past decade yielding a wealth of information on picornavirus biology and disease. *Molecular Biology of Picornaviruses* offers an up-to-date, in-depths analysis of all major aspects of picornavirus research, providing a summary of the many significant accomplishments in this research as well as a road map of the path to future discoveries. To coordinate this remarkable quantity of contributors to this publication required evidently excellent organizational skills exerted by the editors.

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