BOOK REVIEWS

Reoviruses I: Structure, Proteins and Genetics Current Topics in Microbiology and Immunology 233/I

Edited by K. L. TYLER and M. B. A. OLDSTONE. ISBN 3-540-63946-2. 1998. Springer-Verlag, Berlin. Pp. 223. £83.00.

Reoviruses I: Cytopathogenicity and Pathogenesis Current Topics in Microbiology and Immunology 233/II

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In man, reoviruses are still considered orphan viruses in that only a few cases of neurological disease have been tentatively associated with them. Although most people acquire antibody to reoviruses at an early age, no symptomatic reovirus infection has been reported. However, their close but distinct relatives, the orbiviruses and rotavirus are important veterinary and human pathogens. They are worthy of study because of this close relationship and because of their unusual molecular biology. Their genome consists of double-stranded RNA that is not continuous but is broken-up into 10 discrete segments that encode 11 proteins. Such segmentation as this is common in RNA viruses, but unlike the segmented genome of, say, influenza A virus, each reovirus particle contains just one copy of each segment. In nature or when handled properly in the laboratory they are, therefore, highly infectious. More importantly, the reovirus genetic elements can be manipulated relatively easily, allowing close study and elucidation of the function of the viral proteins. Reoviruses are very thrifty with their genetic information and most if not all of the viral proteins, including structural proteins, have enzymic functions.

Despite the lack of X-ray crystallography, reovirus structure is relatively well understood and this owes much to studies with cryo-electron microscopy and their three-dimensional image reconstruction of fully hydrated virus particles. This structure and its relationship to function are clearly described in the first chapter of this excellent monograph. The rest of the volume is devoted to reovirus genetics and structural and non-structural protein function.

The molecular basis for reovirus pathogenicity and virulence has become a paradigm that is central to the chapters that makeup volume two. Apoptosis, persistence, pathogenesis in myocarditis, gastrointestinal disease and central nervous system infections are the subjects of separate chapters. Most of the work described is based on the mouse model and especially SCID mice. The model allows a clearer understanding of the molecular mechanisms and genetic basis of reovirus cell tropism and pathogenicity.

The immunology of reovirus infections is covered in the latter chapters of this volume – in particular the role of the interferon system and cellular and humoral immunity. The mucosal immunity to reovirus infections has a dedicated chapter which should be of interest to all virologists, as mucosal immunity presents the first line of defence against many viral infections.

All authors' honoraria received from the publication of both volumes will be used to support a lecture series on viral pathogenesis in honour of the late Bernard Fields, the founding editor of *Field's Virology*, who died in 1995, and 'one whose presence is found throughout both volumes'.

G. BEARDS