

Biology of Collagen

ANDRUS VIIDIK and JENS VUUST (Editors)
Academic Press, London, 1980, pp. 384, £35.00

This book is based on the proceedings of the International Symposium held in Aarhus University in July/August 1978. However, the articles are in general not research reports but mini-reviews. It is a pity that it is now well over 2 years since this symposium, as some of the material is now out of date, and other fields such as collagen polymorphism, especially in relation to basement-membrane structure, have become far more prominent.

However, this book does cover a wide variety of collagen and related topics. The first four chapters deal competently with the structure of collagen and, although not comprehensive, adequate references are given for further reading.

The next four chapters cover collagen synthesis from various viewpoints, including a useful review of cell culture conditions. Other chapters on collagen degradation, turnover, genetic control and immunology review the recent literature well.

There are several chapters dealing with various medical aspects of collagen and include reconstituted collagen fibrils as a biomedical product, fibroblast activating factors, wound healing

and diseases such as atherosclerosis, idiopathic scoliosis, Ehlers–Danlos syndrome and osteogenesis imperfecta.

The mechanical and physical properties of collagen fibres are covered in several chapters. These articles contain considerable mathematical formulae which the non-specialist reader may find difficult to follow.

Other topics covered include a chapter on the co-evolution of collagen and a review on fibronectin. In view of the vast amount of recent literature on this protein, this article is limited to the authors' own fields of research.

In addition to the articles, this book has a good and comprehensive index, an invaluable asset in a book covering so many different areas of collagen research.

Overall I thought this an interesting book, in part, because of the diversity of topics covered. Inevitably, in a book of this nature, some chapters will be less inspiring than others, but on the whole the standard is very good.

This book should appeal to the specialist collagen researcher as well as others whose interests may be on the periphery of connective-tissue research. However, I feel the rather high price may discourage some of the less committed potential readers.

V. C. DUANCE

Schistosoma mansoni: The Parasite Surface in Relation to Host Immunity

DIANE J. McLAREN
Research Study Press, Chichester, 1980, pp. 229, £18.00

Schistosoma mansoni is one of three species of blood fluke which parasitise man in tropical and sub-tropical regions. It is estimated that 200–300 million individuals are afflicted by schistosomiasis, making it a disease of major importance. The worms are about 1 cm long, threadlike and inhabit the hepatic portal blood vessels between the intestine and the liver. The females lay spined eggs which must pass through the walls of the gut to be voided in the faeces if transmission to the snail intermediate host is to occur. A proportion of eggs fail to escape and are washed downstream to lodge in the liver. Here they set up a chain reaction of pathology which can ultimately result in the death of the infected individual. For most people, ill health, debility and lowered resistance to other diseases are the legacy of infection.

The fact that schistosomes can live in the bloodstream implies that they have some mechanism for evading the host's immune defences. However, conventional wisdom, based on studies using laboratory hosts, suggests that although a host may harbour adult worms, it is capable of eliminating subsequent infections of juvenile worms. This phenomenon has been termed concomitant immunity. Dr. McLaren's book reviews current knowledge and ideas on these interrelated subjects.

One of the more satisfactory aspects of schistosome research to which Dr. McLaren has made significant contributions is our knowledge of worm ultrastructure. The surface of the worm consists of a unique double outer membrane, and it is suggested that this structure assists in protecting the parasite against the immunological responses of the host. The cercaria larva, which infects man by penetrating through the skin, does not possess the double membrane, but acquires it shortly after entry. The structural changes accompanying this transition from free-living stage to parasite are described in detail.

Dr. McLaren goes on to discuss studies on immunity to schistosomes in a variety of primates and rodents. This aspect of research is currently in flux. There is no accepted consensus, perhaps because the fate of an infection depends on host species. For example, the exact location at which invading parasites are

killed is by no means certain. Equally problematic are the precise mechanisms by which the host eliminates the worms.

For this reason, researchers have turned to much simpler and more rigorously controlled studies *in vitro* on juvenile parasites as targets for the host immune response. Dr. McLaren has attempted to synthesize from the large number of investigations a consensus view of immune-effector mechanisms. Experimental systems involving antibodies plus effector cells such as eosinophils, neutrophils or macrophages seem to be effective against juvenile worms. Their relevance to the situation *in vivo* is hard to judge, and researchers are now attempting to find evidence for any or all of these systems *in vivo*.

The surface of the schistosome is the key to understanding how the immune response is evaded. Dr. McLaren describes differences between juvenile and adult worms and highlights the decreased surface antigenicity of the growing parasites. This leads inevitably to a discussion of the postulated mechanisms by which the adult worms evade immune attack. Judging from the text devoted to it, Dr. McLaren favours the idea of antigen masking. There is abundant evidence that adult worms carry on their surface molecules of host origin which are believed to mask parasite surface antigens. The chief candidates for this masking role are host erythrocyte glycolipids, and we can thus envisage the worm disguising itself as a gigantic erythrocyte. The hypothesis has another attractive feature which would explain concomitant immunity. Young parasites, which would not have had time to acquire the disguise, would be vulnerable to immune attack while still in the skin.

The final chapter is entitled 'Changes in the molecular organisation of the schistosome membrane.' However, information on this subject is derived almost exclusively from freeze-fracture observations using the electron microscope. It emphasizes how little hard biochemical information we have on this intriguing cell surface.

This book is undoubtedly for the specialist. It does not contain much biochemistry, but it will have served a useful purpose if it draws the attention of biochemists to an interesting problem, the solution to which lies partly in more extensive biochemical investigations of the worm's surface membranes.

R. A. WILSON

Parasites are, by their nature, harmful to their hosts. Over the last century, this line of thinking has informed our approach to the treatment and control of human infectious diseases.Â Concomitant Immunity. To minimize intraspecific competition, adult worms might protect their host against new infections. Termed concomitant immunity, anti-larval immunity, or density-dependent recruitment (not to be confused with density-dependent fecundity), this phenomenon is well-supported in the literature.Â 55. Dalton P, Pole D. Water-contact patterns in relation to *Schistosoma haematobium* infection.Â 63. Dissous C, Capron A. *Schistosoma mansoni*: antigenic community between schistosomula surface and adult worm incubation products as a support for concomitant immunity. *Schistosoma mansoni* is a water-borne parasite of humans, and belongs to the group of blood flukes (*Schistosoma*). The adult lives in the blood vessels (mesenteric veins) near the human intestine. It causes intestinal schistosomiasis (similar to *S. japonicum*, *S. mekongi*, *S. guineensis*, and *S. intercalatum*). Clinical symptoms are caused by the eggs. As the leading cause of schistosomiasis in the world, it is the most prevalent parasite in humans. It is classified as a neglected tropical disease. As of