The molecular biology and pathology of elastic tissues. Ciba Foundation. Eds D J Chadwick, J A Goode, (Pp 361; £49.95.) Chichester: Wiley, 1995. ISBN 0-471-95718-6.

An invitation to a symposium held at the Windsor Golf and Country Club, Nairobi, Kenya, would be tempting whatever the topic. Most schedules could stretch to include a meeting on elastic tissues.

The proceedings from this meeting, which are published by the Ciba Foundation, are an excellent, up to date review of the biology and pathology of elastin. This is the result of bringing together a group of experts in the field who are working in a variety of disciplines and allowing them not only to present their individual work but also to record their discussions and deliberations after each presentation. In addition, the text of five separate general discussions is also included. The inclusion of the discussion allows the reader to understand more fully areas of consensus and also detect those issues which are contentious and where diverging views are held.

Elastin is often thought of as inert and consequently boring, a misunderstanding commonly held for extracellular matrix proteins that are relatively resistant to chemical and enzymic attack. The discovery of specific proteinases that can degrade elastin and the careful elucidation of the structure of this protein, its sequence and formation of cross links, has done much to reverse these prejudices.

The discovery of elastin in the 19th century and the subsequent milestones in later studies are described in the introduction. Following chapters describe the structure of the molecule and the formation of twisted filaments from a biophysical perspective. The appearance of various elastic tissues under the microscope is described by freeze fracture and negative staining on cryosections. The beaded filaments form a complex three dimensional network in blood vessels and the lung and in other tissues such as the skin.

The isolation and characterisation of full length cDNAs for chicken, cow, rat, and human elastins are described and compared. Analysis of the promoter region suggests that the regulation of gene expression is complex and takes place at several levels. The discussions throughout the conference on this issue show that this is a controversial area.

The control of elastin during aging and in several pathological states is discussed in a number of chapters, with both excess deposition and inappropriate removal being shown to cause different diseases. The involvement of lung and also blood vessels in disease predominates, but the involvement of skin and other organs is also considered. The importance of this molecule in the development and function of the circulatory and respiratory organs is well illustrated.

Equally there are some interesting chapters that illustrate the role of elastin in some tissue and organs that are less well recognised; exactly why porcupine sinuses are pin pointed is not clear, but this chapter demonstrates some fascinating associations between elastin and collagen fibres (possible picture) and their role in mechanoreceptor mechanisms. It gives some beautiful illustrations of structure-function relationships in specialised tissues. The role of membrane associated elastin-binding proteins with high affinity for tropoelastin and fragments of insoluble elastin is described. Their role in different cellular reactions, such as chemotaxis, the release of enzymes and oxygen radicals, and cell adhesion, is discussed.

The book is well illustrated with raw data included as well as illustrations; if interest flags there are some interesting polka dot bar charts that should re-invigorate all but the most cynical readers. Each chapter is referenced and the book is indexed allowing further study.

For an all round review of this important protein this volume will be hard to beat. In addition, the full text of the discussions gives some insight into areas of controversy and future study.

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Electron micrograph illustrating the presumptive physical linkage between elastic (E) and collagen (C) fibres in the carotid sinus wall of the rock hyrax. (Reproduced with permission of the Ciba Foundation from the book reviewed here.)