

**Breit SN, Wahl SM, editors. TGF- $\beta$  and Related Cytokines in Inflammation (Progress in Inflammation Research Series, Parnham MJ, series editor). Basel-Boston-Berlin: Birkhäuser Verlag; 2001. 201 pages; ISBN 3-7643-6009-7; price: US\$129.**

**Field of medicine:** Immunology.

**Format:** Hardcover book.

**Audience:** Academic and industrial biomedical researchers, pharmacologists, rheumatologists, allergologists, pathologists, neurologists, dermatologists, and other clinicians requiring regular scientific updates on transforming growth factors.

**Purpose:** The book provides an overall assessment of the transforming growth factor (TGF)- superfamily, and can be regarded as a ready source of information related to the proteins that play a role in inflammation, wound healing, and repair.

**Content:** The book is divided into eight chapters. Each chapter consists of short introduction followed by titled paragraphs that deal with the specific topic, and ends with a list of references. The first chapter introduces the TGF- superfamily members, specifically MIC-1, and their role in inflammation. It first describes the structure of the MIC-1 gene and protein, than its processing and secretion, and finally the role of MIC-1 and other members of the TGF- superfamily in inflammation.

The second chapter is probably the most complex, describing signal transduction mechanisms for the members of TGF- superfamily, including the binding of TGF- family protein to its serine/treonine kinase receptor, activation of downstream Smad molecules, and their interactions with DNA elements, coactivators, corepressors, and chromatin-modelling factors, as well as cooperation with transcription factors.

The third chapter deals with the effects of TGF, primarily TGF- $\beta$ , on the endothelium. The regulatory roles of TGF in endothelial cell differentiation, angiogenesis, inflammation, and endothelial cell signaling are explained. The most intriguing paragraph deals with the role of TGF in some common endothelial cell-associated diseases, such as cancer, psoriasis, and wounding.

The fourth chapter discusses TGF- $\beta$  and macrophages in the rise and fall of inflammation. The inflammatory process is a complex cascade of events in which TGF- $\beta$  may have both pro-inflammatory effect at the initiation phase and anti-inflammatory effect at the resolution phase of inflammation. The chapter

concludes with the role of TGF- $\beta$  in the microbial subversion of the host response.

The fifth chapter overviews the multiple roles of TGF- $\beta$  superfamily members in the development and function of the normal heart and vasculatory system. It explains the mechanisms of aberrant regulation of the TGF- $\beta$  system known to be involved in cardiovascular disease development or progression, e.g., hypertrophic cardiomyopathy, myocardial infarction, atherosclerosis, restenosis, hypertension, and other.

In the sixth chapter, bone morphogenetic proteins (BMPs) and other related cytokines of the TGF- $\beta$  superfamily are described, starting with the isolation of BMPs, their functions and actions, receptor binding, and finally the clinical applications. Although BMPs regulate each of the key steps of cartilage and bone development, recent work with gene knock-outs in mice have revealed "a plethora of actions beyond bone".

The seventh chapter focuses on glial cell-line derived neurotrophic factor (GDNF), which promotes the differentiation, development, growth, maintenance, and regeneration of neurons. The chapter describes the sites of GDNF expression, its receptors, essential functions, and delivery into the central nervous system. The known properties of the other neurotrophic factors (neurturin, persephin, and artemin) and their comparison to GDNF are also discussed.

The final chapter describes the roles of TGF- $\beta$  superfamily cytokines in wound healing, since those cytokines are shown to be "extremely important in the biological processes required for normal wound healing and optimal scar formation". It discusses TGF- $\beta$  proteins with their isoform-specific effects, activins/inhibins, and BMPs, regarding their mechanisms of activation, receptor signal transduction, and expression during wound repair. The chapter offers examples of knock-out and transgenic animal studies, preclinical studies of TGF- $\beta$  in impaired wound repair, and clinical applications of TGF- $\beta$  in wound healing.

**Highlights:** The book unifies specific fields of experimental and clinical immunology. Topics such as subversion of TGF- $\beta$  signaling in cancer, antiparkinsonian actions of GDNF, therapeutic modulation of TGF- $\beta$  during inflammation, and clinical applications

of BMPs in tissue regeneration, are very inventive and may not be found in other similar books. Schematic figures and tables contribute to the clarity of the text. Most chapters finish with concluding remarks that help reader to summarize the information given within the chapter. Index, at the end of the book, facilitates quick orientation and selective reading.

**Limitations:** Although each chapter begins with a short introduction, it cannot give the complete overview of rather complex processes and mechanisms. The book may not be used as a student textbook appropriate for acquiring the basic concepts of TGF- $\beta$  superfamily, but requires a certain amount of previous knowledge. The book does not systematically cover all known data related to TGF- $\beta$  superfamily proteins, but rather discusses in more details specific

topics chosen by different authors. Although it is not a limitation by itself, chapters partly overlap in their content and thus create redundancy.

**Related reading:** Other books from the *Progress in Inflammation Research Series*, which provides up-to-date information on the latest development in the pathology, mechanisms, and therapy of inflammatory diseases. Areas covered include vascular responses, skin inflammation, pain, neuroinflammation, arthritis, airways inflammation and asthma, allergy, cytokines and inflammatory mediators, cell signaling, and recent advances in drug therapy. Each volume is edited by acknowledged experts and provides succinct overviews on specific topics.

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