

DOI: 10.4103/ijmr.IJMR\_406\_17



**Principles of osteoimmunology: Molecular mechanisms and clinical applications**, 2<sup>nd</sup> edition, P. Pietschmann, editor (Springer International Publishing, Switzerland) 2016. 328 pages. Price: Not mentioned.

ISBN 978-3-319-34236-8

This book offers a comprehensive review of the subject of osteoimmunology to those interested in immunology and pathophysiology of bone. The book is organized into 12 chapters, all ending with an extensive bibliography. Basics of bone biology are well covered in the first chapter, but a few more figures and sketch diagrams could have enhanced the comprehensibility of the text, which is so descriptive. Chapter 2 describes the principles and technical aspects of automated detection and characterization of osteoclasts. Undoubtedly, applying image processing and machine-learning techniques to biological and medical images can improve the quality of research. Osteoclast quantification is currently done manually with a wide intra- and inter-observer variability. Automated system, on the other hand, offers better quality, efficiency and consistency. Chapter 3 presents an overview of the immune system. The concepts are presented in a lucid manner and will be appealing to beginners in immunology. Chapter 4 deals with various basic and applied aspects of Vitamin D in relation to immune system. The topic is well covered and illustrated with figures and tables. The possible role of Vitamin D in autoimmune conditions such as rheumatoid arthritis, type 1 diabetes and multiple sclerosis is described particularly well.

Chapter 5 describes the osteoimmunological aspects of biomechanics. It elucidates the immunological communication pathways, which modulate the activities of osteoblasts and osteoclasts. Chapter 6 deals in detail with various biomarkers of bone metabolism such as parathyroid hormone (PTH), PTHrP (PTH-related peptide), vitamin D, collagen and collagen products, TRAP 5b (tartarate-resistant acid phosphatase 5b), alkaline phosphatase, bone alkaline phosphatase, osteocalcin and RANKL (receptor activator of nuclear factor-kappa B ligand)/OPG (osteoprotegerin). New markers such as cathepsin K, matrix metalloproteinases (MMPs), bone sialoprotein, osteonectin (SPARC, secreted protein acidic and rich in cysteine), phosphatonins (FGF23, fibroblast growth factor 23), Wnt-associated proteins and receptors and sclerostin have also been described well. The clinical or practical utility of each marker is discussed in clear terms. Adequate emphasis has been laid on the value of bone biomarkers in monitoring response to treatment, compliance to medications and in guiding therapeutic decisions. Reasonably good account of pathophysiology and clinical aspects of osteoporosis is given in chapter 7. It also includes some interesting

concepts such as the role of gut microbiota and oral intolerance on the pathogenesis of osteoporosis. Chapter 8 deals with two major rheumatic disorders, namely, rheumatoid arthritis and spondyloarthritis. Mechanisms of bone erosion and new bone formation are well described. Reference is also made to psoriatic arthritis here in some depth.

Chapters 9 and 10 pertain to preclinical and clinical data, respectively, on the treatment of bone diseases with therapeutic antibodies. Details on various animal models and lessons learnt from these are well discussed. Immunotherapy of cancer-associated osteolytic lesions in animal models is also covered. The data on denosumab trials illustrate how basic research findings can translate into a regular treatment modality for management of osteoporosis and other bone disorders. The next chapter is dedicated to osteoporosis in organ transplant recipients (mostly, steroid-induced osteoporosis), and the last one is a well compiled review of osteoimmunological aspects of periodontal diseases.

Overall, this is a well-written book on the subject of osteoimmunology, which will be useful to both researchers and clinicians. The methodical and point-wise description of the relevant topics is a strength of the book, which will appeal to the readers.

**Ashok Kumar**

Department of Rheumatology,  
Fortis Flt. Lt. Rajan Dhall Hospital,  
New Delhi 110 070, India  
ashok.145@gmail.com