



# Osteoimmunology: Interactions of the Immune and Skeletal Systems

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## Osteoimmunology: Interactions of the Immune and Skeletal Systems From Academic Press

Bone and the immune system are both complex tissues, which, respectively, regulate the skeleton and the body's responses to invading pathogens. Critical interactions between these two organ systems frequently occur, particularly in the development of immune cells in the bone marrow and for the function of bone cells in health and disease. This book provides a detailed overview of the many ways that bone and immune cells interact. The goal is to provide basic and clinical scientists with a better understanding of the role that the immune system and bone play in the development and function of each other so that advances in both fields will be facilitated.

The focus of the book will be both on basic pathways and translational science, which will apply basic knowledge to clinical diseases. Chapter content will range from basic descriptions of the various cell systems and their development to the signals that cause them to interact during normal physiology and disease. This is a rapidly developing area that is of interest to a wide spectrum of researchers, students, and fellows in immunology, rheumatology, hematology, and bone biology--all of whom need to develop a more complete understanding of their previously separate disciplines and the mechanisms by which they interact.

- Presents a comprehensive, translational source for all aspects of osteoimmunology in one reference work
- Experts in bone biology and immunology (from all areas of academic and medical research) take readers from the bench research (cellular and molecular mechanism), through genomic and proteomic analysis, all the way to clinical analysis (histopathology and imaging) and new therapeutic approaches.
- Clear presentations by bone biologists of the cellular and molecular mechanisms underlying bone cell development leading to bone and immunological diseases such as Lupus
- Clear presentations by immunologists of how immune cells develop and how the immune system plays a role in bone diseases like osteoporosis and arthritis



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### Editorial Review

#### Review

"Edited by four pioneers in the field of osteoimmunology, this book contains chapters by 44 outstanding experts, spanning the breadth and depth of our current knowledge of osteoimmunology from cell and molecular biology to clinical problems."

--Tatsuo Suda, Member of the Japan Academy, Associate Member, Science Council of Japan, Emeritus Professor of Showa University, Visiting Professor, Research Center for Genomic Medicine, Saitama Medical University, Japan

"The new textbook of osteoimmunology provides a comprehensive introduction to this recently established field that seeks to bridge two-well established disciplines. By reviewing both well-established concepts in bone biology and recent advances in our understanding of the interactions between the immune and skeletal systems, the text serves as both an excellent introduction to the field and a state of the art summary. Overall, each chapter provides concise history of work in the area, thus both immunologists and bone biologists can gain a view of how current paradigms evolved to their current states. This makes the book of particular use to trainees that have studied primarily immunology or bone biology in the past but know little about the other. Early chapters focus on specific cell types in the bone such as osteoclasts or osteoblasts and review both the cellular differentiation and function and our current knowledge regarding immune regulation of the cells. Later chapters nicely focus on specific pathologic states in the bone such as inflammatory arthritis or fracture healing and provide a comprehensive review of studies investigating the role of the immune system in these models. The field of osteoimmunology is rapidly expanding and evolving quickly, this textbook will help put all of us on the same page and help us understand how we got here."

--Mary C. Nakamura M.D., Associate Professor of Medicine, UCSF, Division of Rheumatology, San Francisco, CA, USA

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#### About the Author

Dr. Lorenzo is Professor of medicine in the Division of Endocrinology and Metabolism and Director of Bone Biology Research at the University of Connecticut Health Center. He is a nationally renowned expert on bone remodeling and its effect on bone health.

Dr. Horowitz is Professor of Orthopaedics and Rehabilitation at the Yale University School of Medicine. His research interests include the interactions between the skeletal, immune, and hematopoietic systems as they relate to normal and pathologic bone remodeling.

Dr. Choi is Professor of Pathology and Laboratory Medicine, University of Pennsylvania; Investigator, The Leonard and Marilyn Abramson Family Cancer Research Institute, Philadelphia, PA.

Dr. Takayanagi is Professor in the Department of Cell Signaling, Tokyo Medical and Dental University. His group studies the mechanism of bone destruction in rheumatoid arthritis, which focuses on the regulation of osteoclasts by T cells. This interdisciplinary field, osteoimmunology, covers various research on shared mechanisms and interactions between immune and bone systems.

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