

## Preface

---

Bone is unique in its inherent capability to completely regenerate without scar tissue formation. This characteristic is central to skeletal homeostasis, fracture repair, as well as bone graft incorporation. However, in some circumstances the regenerative capacity of bone is altered or damaged in a manner that precludes such a special pattern of repair. Fracture nonunions, lost bone stock supporting total joint arthroplasties, and periodontal defects are frustrating examples of these difficult clinical challenges. Allogeneic bone and even autogenous bone grafts have not provided solutions for all these problems, at times related to limitations of their regenerative capacities and also when not used in a manner that respects their biological or biomechanical needs.

Over the past few decades, scientists and clinicians have been exploring the use of growth factors and bone graft substitutes to stimulate and augment the body's innate regenerative capabilities. The development of recombinant proteins and the application of gene therapy techniques could dramatically improve treatment for disorders of bone, cartilage and other skeletal tissues.

*Bone Regeneration and Repair: Biology and Clinical Applications* provides current information regarding the biology of bone formation and repair, reviews the basic science of autologous bone graft, skeletal allografts, bone graft substitutes, and growth factors, and explores the clinical applications of these exciting new technologies. An outstanding group of contributors has thoughtfully and skillfully provided current knowledge in this exciting area. This book should be of value to those in training, clinicians, and basic scientists interested in regeneration and repair of the musculoskeletal system.

*Jay R. Lieberman, MD*  
*Gary E. Friedlaender, MD*