



## New Osteogenic Approaches to Improve Bone Remodeling and Regeneration

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Bone is a unique hard form of connective tissue as a result of its heavily calcified extra cellular components. Like all other connective tissue, it consists of cells, fibers and extracellular matrix being the most abundant. The resulting strength enables bone to perform its function as a frame for the locomotion of the musculo-skeletal system and to protect vital organs.

Bone remodeling is a dynamic process that occur continuously throughout life. One to two million tiny sections of bone are in process of remodeling at any given time. Many cytokines, growth factors, and hormones influence each remodeling step.

There are a wide variety of diseases and certain medications and toxic agents that can cause or contribute to the development of bone loss.

Bone grafting is a surgical procedure that replaces missing bone with material from patient's own body, an artificial, synthetic, or natural substitute. Disadvantage of autologous grafts is that additional surgical site is required, another potential location for postoperative pain and complications. Also, the use of allografts for bone repair often requires sterilization and deactivation of proteins normally found in healthy bone. Synthetic bone grafts start to decrease in usage because it is completely resorbable in short time and makes breaking of the bone easier.

Because of the limitations of current bone grafting methods, alternative methods for repairing bone defects are needed. Recently, bone defect treatment may rest on the use of inductive materials which are completely autologous, as a sole filling material or added as adjuncts to already known biomaterials with success.

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