

Founding Editorial – Bone Biology

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DOMAINS: bone biology

The skeleton is a complicated vertebrate structure, comprised of bone cells that form, modulate, and resorb the extracellular structure of bone. It is the extracellular structure, made up of the bone mineral (largely calcium phosphate) and the bone matrix, which constitutes the visible skeleton and the mechanical support for the vertebrate body. The matrix is the protein structure on which the bone mineral is laid down, many components of which have been identified in recent years.

This simplified description of bone already implies the many scientific disciplines that have in recent decades begun to deal with the skeleton. Anatomists, histologists, inorganic and organic chemists, cell biologists, geneticists, pathologists, physiologists, and a variety of medical specialists — orthopaedists, endocrinologists, nephrologists, rheumatologists, gynecologists, to name just a few — all have an interest in how bone is formed and affected by the life cycle — growth, maturation, reproduction, aging — and in the now emerging abundance of actual and potential treatments of bone disorders and diseases.

It seems entirely appropriate, therefore, that the interdisciplinary, internet journal — *TheScientificWorldJOURNAL*, the journal without boundaries — has organized a Bone Biology Domain under the editorship of a wide variety of specialists. It is our hope and purpose to publish the results of first-rate research in this area. At the same time we intend to publish reviews, symposia in print, and analyses of controversial viewpoints or techniques, with the intent that new findings or re-evaluation of older findings can be viewed in the broad context of skeletal biology. Moreover, the networked arrangement that underlies *TheScientificWorldJOURNAL* and its editorial concept facilitates communication within and between disciplines. Understanding in the bone biology domain can therefore be viewed in an even wider perspective.

Osteoporosis — the change in bone mass and structure that occurs with aging in men and women — is a good example of a condition dealt with by many disciplines. Questions concerning the mechanisms regulating bone formation and resorption that cause the loss in bone mass are of interest to cellular and developmental biologists and to several of the medical specialists referred to above. Disturbances in the normally exquisite regulation of calcium homeostasis can play a role in disorders of bone metabolism, including osteoporosis. They therefore are another example

of the kind of problems that concern a broad spectrum of biological and medical specialists. Inasmuch as the development of a skeleton not subject to early fracture is also the result of an adequate calcium and protein intake, public health policy aimed at delaying the occurrence of osteoporosis must involve questions of nutrition policy and, if a change in food intake is desired, behavioral modification becomes an important issue. Similarly, if hormone replacement therapy is indicated to minimize the continued decrease in bone mass, the physiological and psychological consequences of such therapy must be explored.

With the increase in genetic knowledge questions concerning genetic aspects of osteoporosis are not only being asked, but are likely to receive answers. These answers will, it seems certain, involve not only individual genes, but arrays of genes that induce the synthesis of proteins that play a role in directing cells to their targets, that serve as signals inside cells and in cellular crosstalk. Also, assuring an adequate nutrient supply for the proper development of the skeleton may require, on a population basis, modification of agricultural and therefore economic policies.

As Principal Editor of the Bone Biology domain I have attempted to surround myself with colleagues as Associate Editors and members of the Editorial Board who are experts in the many aspects of the bone biology domain, and I am grateful for their willingness to provide the broad and deep knowledge needed for this task. The listing of their names and addresses contains also a self-description of their expertise. Authors of primary publications or of reviews are invited to submit their contributions to the Journal.

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