Rated ★★ Very Good

07 Aug 2019

Mara Riminucci

F1000 Faculty Member

Rheumatology & Clinical Immunology / Bone Biology, Osteoporosis & Other Diseases of Bone

Sapienza University of Rome
Rome
Italy

Alessandro Corsi

F1000 Associate Faculty Member

Rheumatology & Clinical Immunology / Bone Biology, Osteoporosis & Other Diseases of Bone

Sapienza University of Rome
Rome
Italy

Classified as

New Finding

Bone vascularization is complex and hard to investigate. In their elegant and detailed study, Grüneboom et al. provide very important new insights into the anatomy and physiology of the blood flow in long bones. By means of very modern imaging technologies, the authors demonstrated the existence of a network of a hundred vascular canals, which were properly named transcortical vessels (TCVs), crossing perpendicularly the entire bony cortex of mice and representing the major vehicle for migration of haematopoietic cells (i.e. neutrophils) from bone marrow to systemic circulation. The formation of the TCVs was demonstrated to be strongly related to osteoclasts since genetic and drug-mediated modulation of osteoclast number and activity led to substantial changes in the number of TCVs. The authors also demonstrated that the number of TCVs increased in mice with chronic arthritis and decreased in old mice. Furthermore, they identified vessels structurally resembling TCVs in the human compact bone. The work of Grüneboom and colleagues provides an important advance in our knowledge on the vascular anatomy of bone and on the relationships among bone marrow, bone and the systemic circulation. Although preliminary, their data on TCV-like vascular structures in human bone and on the role of these vessels in bone blood flow, in the modulation of cell migration from bone marrow and in the interaction between osteocytes and osteoclasts in the context of cortical skeletal remodeling seem to have important implications for skeletal biology and for diverse clinical contexts including inflammatory joint disease and fracture repair.

Disclosures

None declared

Cite this Recommendation: Copy to clipboard

Riminucci M and Corsi A: F1000Prime Recommendation of [Grüneboom A et al., Nat Metab 2019 1(2):236-250]. In F1000Prime, 07 Aug 2019; 10.3410/f.734892237.793563361

Less