

イノベーティブ・ デンティストリー特論

骨組織の多細胞社会：恒常性維持と疾患発症機構

Multicellular Society of Bone:

Homeostatic Maintenance and Disease Pathogenesis

Jan.22nd, 2027, PM5:00-7:00

岡山大学鹿田キャンパス 歯学部棟4階 応用講義室

Professor.

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Bone tissue is a highly dynamic structure maintained through continuous remodeling, driven by the precise balance between osteoblast-mediated bone formation and osteoclast-mediated resorption. This homeostatic process is orchestrated by intricate crosstalk among bone-resident cells—osteoblasts, osteoclasts, and osteocytes— together with mesenchymal stem/progenitor cells, stromal cells and immune cells, forming a complex multicellular network. When this finely tuned system is disrupted by stressors such as trauma, inflammation, or malignancy, a spectrum of pathological conditions can arise. In the context of traumatic tissue injury, immune–mesenchymal crosstalk guides healing; when dysregulated, healing can fail, with fibrosis or heterotopic ossification. In bone metastasis, cancer cells exploit the bone microenvironment to disrupt normal remodeling and establish a niche favorable for their progression. In this seminar, we present our studies on the multicellular society within bone tissue, highlighting how immune–mesenchymal cell networks maintain homeostasis in health and how their collapse drives disease.

References:

- Yin W, Okamoto K *et al*, *J Clin Invest*, 136: e193797, 2026
- Hoshino Y, Okamoto K *et al*, *New Engl J Med*, 392: 513-515, 2025
- Asano T, Okamoto K *et al*, *Nature Metabolism*, 1: 868-875, 2019
- Inoue M, Okamoto K *et al*, *Nature Immunology*, 19: 1265-1276, 2018
- Terashima A, Okamoto K *et al*, *Immunity*, 44: 1434-43, 2016
- Guerrini MM, Okamoto K *et al*, *Immunity*, 43:1174-85, 2015
- Okamoto K *et al*, *Nature*, 464: 1381-1385, 2010

The study group are considered as classes of "Introduction of Basic Medical Sciences" and "Introduction of Clinical Medical Sciences" and counted for the unit accreditation. Receive a sign from the organizer on the "Attendance Card", when you attend them. Staffs, graduate students, undergraduate students, and anyone who are interested in are welcome to the lecture.

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