

## Intravital multiphoton imaging revealing immune cell dynamics in inflammation and bone destruction *in vivo*

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／医学教育図書棟 3 階 第 2 講義室

### ABSTRACT

During the last decade, multi-photon fluorescent microscopy has launched a new era in the field of biology. By using this advanced imaging technique we have established a new system for visualizing *in situ* behavior of a diversity of living cells within intact tissues and organs. Among them, we succeeded in visualizing the various dynamic phenomena within bones, a mysterious organ where various kinds of hematopoietic and immune cells are produced and functioning although poorly analyzed by conventional methodology such as histological analyses with decalcified bones. Especially we have focused on the behavior of osteoclasts, a kind of specialized macrophages contributing bone destruction in arthritic joints as well as osteoporosis, and have been revealing novel mechanisms controlling migration and function of osteoclasts *in situ*. In this presentation, I will present our latest data on cellular dynamics in bone and inflammatory biology, and discuss the future applications of this novel methodology for the development of clinical immunology and medical sciences.

#### References:

- 1) Ishii et al. *Nature*, 458: 524-528, 2009.
- 2) Klauschen, Ishii, et al. *Nature Protoc*, 4: 1305-1311, 2009.
- 3) Ishii et al. *J. Exp. Med.*, 207: 2793-2798, 2010.
- 4) Kikuta et al., *J. Clin. Invest.*, 123: 866-873, 2013.
- 5) Kikuta et al., *Proc. Natl. Acad. Sci. U.S.A.*, 110: 7009-7013, 2013.



#### Reviews:

- 1) Ishii M. How do contemporary imaging techniques contribute to basic and clinical rheumatology? *Ann. Rheum. Dis.*, 71: i67-9, 2012.
- 2) Kikuta J, Ishii M. Osteoclast migration, differentiation, and function: novel therapeutic targets for rheumatic diseases. *Rheumatology*, 52: 226-34, 2013.



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