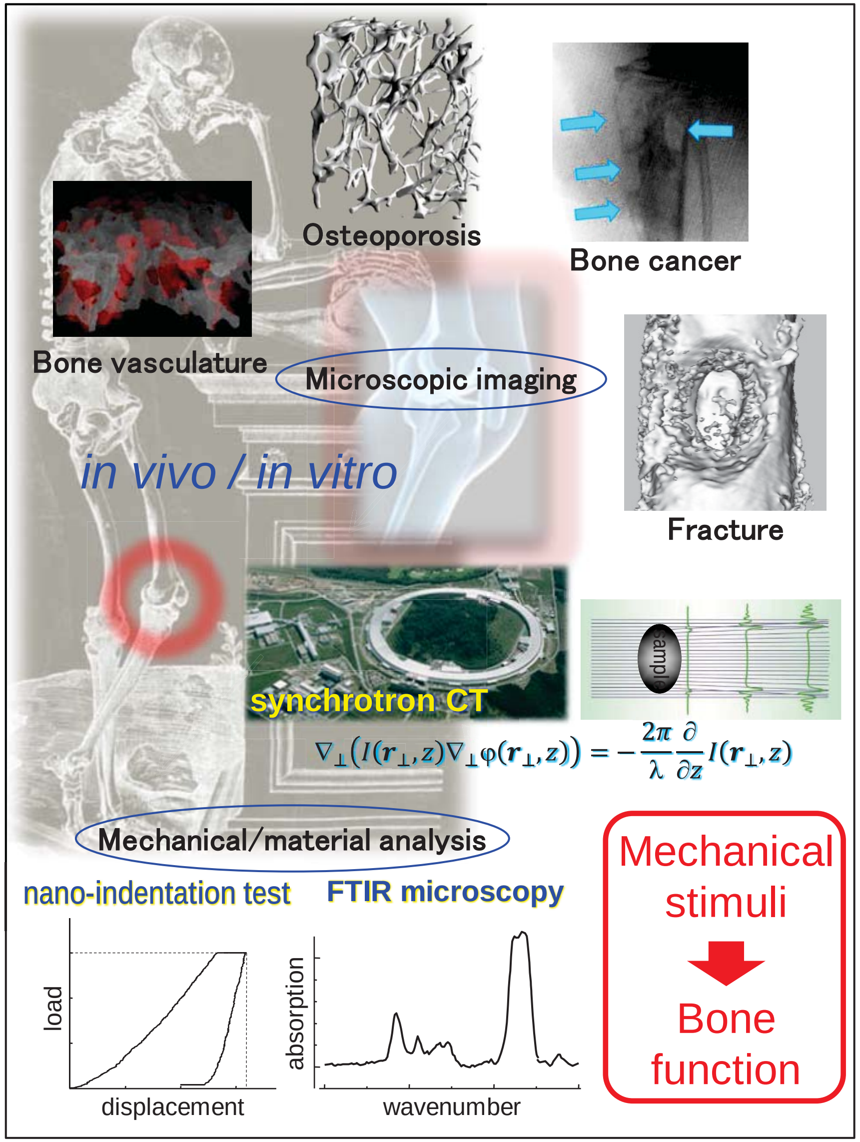
Faculty of Engineering
Tokushima University

Bone response to mechanical stimuli

Professor Takeshi Matsumoto



Quantification of 3D bone microstructure is essential for evaluating bone functions, such as mechanical strength, fracture risk, or bone metabolism. Synchrotron radiation computed micro-tomography has opened up new possibilities in the analysis of bone microstructure. With the high intensity and natural collimation of synchrotron X-ray sources, bone images can be reconstructed with high resolution and high quality. The monochromatization of synchrotron lights also permits the enhancement of image contrast of a target material through harnessing its K-edge absorption jump. By taking these advantages, we have been working on in-vivo/vitro imaging of rodent bone microstructure in the 3rd generation synchrotron radiation facility, SPring-8 (Japan). In addition, we evaluate bone material properties by using nano-indentation test and FTIR microscopy. Our research interests are the effects of mechanical stimuli on bone development, fracture healing, and bone tumor growth, especially with focusing on bone vascularization.

Keywords: medical engineering, synchrotron radiation CT, osteoporosis, bone cancer

E-mail: t.matsumoto@tokushima-u.ac.jp
Tel. +81-88-656-7374
Fax: +81-88-656-7374