Outline

Interests in our research are of osteocytic and chondrocytic survival in the calcified matrix. Osteocytes are literally buried within the bone matrix, exit in lacunae and canaliculi, and form three-dimensional interconnected networks with neighboring osteocytes or osteoblasts, bone lining cells, and osteoclasts on bone surface. The osteocytes and a communication network play an integral role in nutrient exchange, oxygen homeostasis, regulation of osteoblastic and osteoclastic recruitment and activity, and probably mechanotransduction or mechanosensing to mechanical loading. However, molecular mechanisms by which osteocytes are buried alive in its microenvironment remain yet to be investigated.

We teach human gross anatomy, especially the structure of head and neck, for undergraduate students, and take an interest in clinical problem concerning a relationship between Hounsfield units, bone mineral density and structure of trabecular bones in the mandibular bones of human cadavers.

Faculty members

Professor; Yasunori Sakakura Ph.D.
Assistant professor/research associate ; Toru Shibui D.D.S., Ph.D.
Assistant professor/research associate ; Masami Takahashi D.D.S., Ph.D.

Postgraduate students

none

Main research in progress

1) Change of interconnected networks with osteocytes and other bone associated cells after bone remodeling
2) Survival of osteocytes in calcified bone tissues during bone remodeling
3) A relationship between Hounsfield units, bone mineral density and trabecular structure in human cadavers
In hypertrophic chondrocytes, up-regulation of GLUT3 by HIF-1α facilitates intake of glucose. Most of intracellular glucose contributes to accumulation of glycogen, the other is used to produce the energy using glycolytic enzymes. As hypertrophic chondrocytes is encompassed by calcified matrix, glycogen is consumed to supply glucose for survival.

Our question is how osteocytes within old bone matrix survive after disconnection of bone canaliculi network by bone resorption. White star presents the disconnection of bone canaliculi.

Current publications
