Our department was formally founded at 1947. From the new millennium, the present Professor and Chairman Akio Minami brought up new research of tissue engineering and applied some of the new technologies developed in our department to human musculoskeletal diseases and injuries. Other recent advances in our department are minimally invasive surgery and high-tech surgery under navigation in both joint surgery and spine surgery.

Our mission is to provide undergraduate and postgraduate education and training to an international standard, offer a first-class orthopaedic service to the people of our community, enhance basic and clinical research, promote strong links with domestic and international orthopedic centers, and maintain the international character of the department.(Manabu Ito, MD, PhD)

**Research**

Since 2000, we have mainly focused on the following research projects.

1) Musculoskeletal tissue engineering: Our main targets are cartilage, rotator cuff, nerve and bone tissue engineering. We have developed novel and unique 3-D scaffolds to enhance tissue regeneration from culture cells. The goal of our project is to clinically apply our developed scaffold for the treatment of musculoskeletal diseases.

2) Pathogenesis of osteoarthritis (OA): We have used 2 different approaches: genetic and glyco-biological, to elucidate OA pathogenesis. Glyco-biological approach must be unique and potent one to detect crucial molecules related to OA pathogenesis. We expect this approach will be a main stream in the field of musculoskeletal research.

3) Bone metabolism and osteoporosis: Glyco-biological analysis has also been applied to these fields. We have clarified the functional roles of glycans or glycoproteins in osteoclast differentiation.

These projects are performed in Frontier Research Center for Post-genome Science and Technology, Hokkaido University. To progress our projects, we have actively collaborated with other departments, including chemistry, genetic science, pharmacology, and engineering laboratories. So, our department is opening research positions for young researchers (not only in medical field, but also in other fields), who are interested in musculoskeletal research. We can accept such researcher as a PhD or MS candidate. Please, join to our research laboratory. In addition, we can also work with company or industrial researchers to develop novel biomedic products or therapeutic agents. Please, contact us. (Norihisa Iwasaki, MD, PhD)

**International Activities**

Recent invited talks in international conferences


Manabu Ito (2008) SICOT/SIROT 2008XXIV Trennal World Congress, Hong Kong.

Manabu Ito (2007) AO Spine Master Course, Davos, Switzerland.

Yoshishia Kotani (2006) Hong Kong orthopaedic association annual congress, Hong Kong.

On going international collaborations

Professor Aki Minami, MD, PhD and Yoshishia Kotani, MD, PhD are collaborating with Medtronic Sofamor Danek (Memphis, USA) for the world-wide clinical trials of artificial intervertebral disc prosthesis. This research has been continuously conducted since 1998 with Takiron, Co. LTD (Osaka, Japan).

**Selected Publications**


