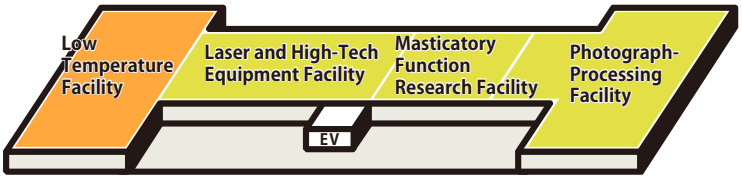
Low Temperature Facility

Building 3
3rd Floor

The facility is equipped with laboratories and equipment for separation and purification of functional substances such as proteins and polysaccharides from living bodies using the low-temperature environment. It also has laboratories and equipment in which dental materials can be examined under the environment at extremely low temperature or constant temperature and humidity.
A two-dimensional electrophoresis apparatus for protein analysis is also equipped.



Ultralow temperature tank R-100LM

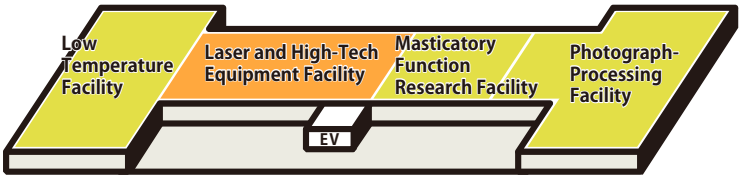
Medical freezer MDF-U442 (SANYO)

Freeze dryer DC800 (YAMATO)

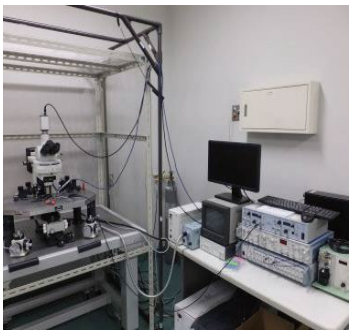
Laser and High-Tech Equipment Facility

Building 3
3rd Floor

Laser is one of the most important devices that humans invented in this century. A laser beam has three characteristics: good monochromaticity, good directivity, and high power. In quantum mechanics, light is a collection of particles (quantum) called photons, and the uniformity of the energy of a photon leads to directivity, and a laser beam containing a very large number of photons leads to high power. It is widely applied in the fields of dentistry and medicine such as: surface treatment of dental enamel, giving acid resistance, removal of dentin caries, reduction of occlusal pain, laser scalpel, treatment for retinal detachment, LASIK (ophthalmology), and removal of lentigines/melanin spots (dermatology).



This institution is currently used as an open laboratory for experimentation by faculty members, postgraduates, and undergraduates of School of Dentistry and Faculty of Health Sciences.



Microscopic electrophysiological system patch-clamp (Nikon)

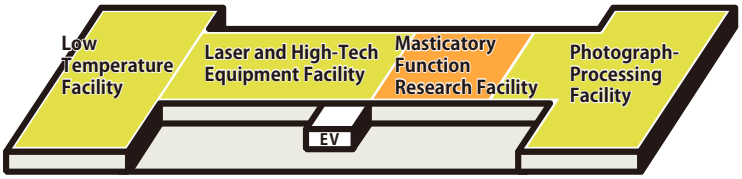
A device for examining ion channels such as potential difference and conductivity by attaching a cell membrane of a specific cell to the tip of a fine glass electrode with a pore under a microscope.

Open laboratory

Masticatory Function Research Facility

Building 3
3rd Floor

Laboratory equipment for various research related to mastication is installed. In particular, a shield room equipped with devices for measuring and recording biopotentials (e.g. jaw and facial muscle activity) during mastication and a measuring instrument for plantar pressure distribution are used for the study of the relationship between masticatory movement and systemic function.



Shield room

Electromagnetic shielding room to improve the measurement accuracy of the biological monitor.

Pressure distribution measurement system I-SCAN, T-SCAN (NITTA)

The pressure distribution is measured using an ultra-thin film sensor.

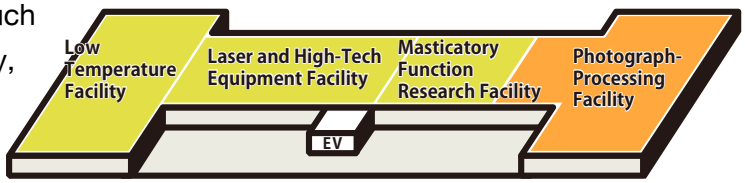
Transcranial magnetic stimulator Magstim2002 (Miyuki Giken)

A device that uses a single magnetic stimulation pulse to induce tissue current in the body and stimulates nerves and muscle tissue.

Photograph-Processing Facility

Building 3
3rd Floor

There is a device that can digitalize analogous images obtained from various microscopes with the latest devices necessary for processes such as image monitoring with good reproducibility, image processing, image analysis, stereo image construction, and image output. With the three-dimensional bone quality/bone morphology measurement software, it can analyze the three-dimensional network structure of cancellous bone based on bone tomographic images. Also, a large printer enables the preparation through to the materials for the publication of papers, etc.



Bone quality/bone morphology measurement software TRI/3D-Bon (RATOC Systems)

It is possible to analyze images of bone quality, bone density, bone morphology, etc. from images using permanently installed micro-focus X-ray CT in the morphological research facility.

Large printer MAXART PX-H10000 (EPSON)

It can print a poster up to approx. 1.12 m * 2.5 m.

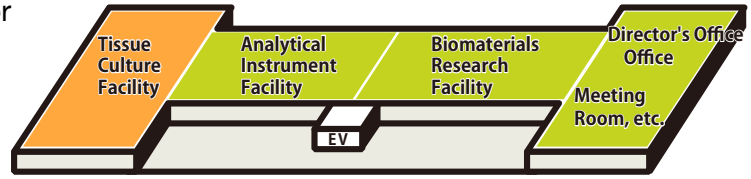
Microscope image input device Mac (Olympus)

The optical microscope images can be imported into a computer with a high vision still image camera.

Tissue Culture Facility

Building 3
2nd Floor

The facility is equipped with equipment mainly for cell culture. There are 3 clean benches and 13 CO2 incubators, which are mainly used for cultivation of human/animal-derived cells. Instruments for analysis are also installed such as an inverted phase contrast microscope for observation of cultured cells, a photographing device for observation of cells, and a confocal laser microscope.



Clean bench (DALTON)

Equipment to prevent contamination of dust and environmental microorganisms and perform aseptic technique during cell culture

CO2 Incubator (YAMATO)

Device that adjusts the internal temperature and CO2 temperature for cell culture

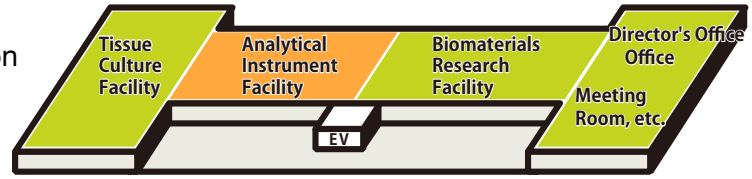
Confocal laser scanning microscope LSM 700 2ch UGRB (Carl Zeiss)

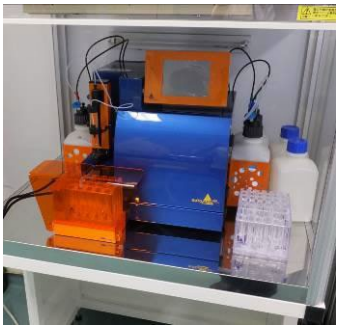
Three-dimensional images can be created by a combination of fluorescence measurements and optical sectioning of specimens in a confocal fashion with a laser beam

Analytical Instrument Facility

Building 3
2nd Floor

This facility meets the needs to obtain knowledge about the type of substances and its content, chemical structure, and existential state. Equipped with biological molecular interaction analyzers, X-ray diffractometer, imaging system, real-time PCR system, high performance liquid chromatography, spectrophotometer, ultracentrifuge, etc.





autoMACS Pro Separator (Miltenyi Biotec)

A computer-controlled automated magnetic cell separation device using MACS technology, which is fully automated from magnetic labeling to separation of samples. It allows high speed and high purity continuous cell separation up to 6 samples.

Real-time PCR system Step One Plus

Device to measure real-time polymerase chain reaction (PCR) amplification. It is used for gene expression, SNPs typing base information, genetic recombinant food testing, detection of viruses and pathogens, and analysis of the number of copies of introduced genes.

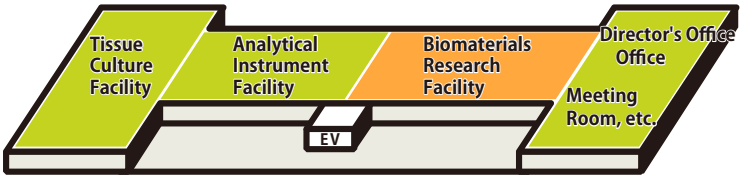
FACSVerse™ Flow cytometer (Beckton Dickinson)

A cell analyzer that uses up to 8 parameters with 3 types of lasers (488 nm/640 nm/405 nm). Apoptosis, cell cycle, cell proliferation, and cytokine detection are possible by using a special reagent kit. There are also FACSCaliburTM and FACSAriaTM cell sorter in the facility.

Biomaterials Research Facility

Building 3
2nd Floor

The facility has equipment to study the physical properties of materials. A universal testing machine, Servo Pulsar, and multiple microplate reader are installed.



Universal testing machine Autograph AGS-X (SHIMADZU)

Device to measure compressive strength, tensile strength, shear strength of experimental samples

Servo Pulsar EHF-F1 (SHIMADZU)

Device to investigate mechanical properties such as tensile strength, bending, fatigue, creep, and destructive elasticity by applying load to samples such as uniaxial tensile strength, compression, and repetition

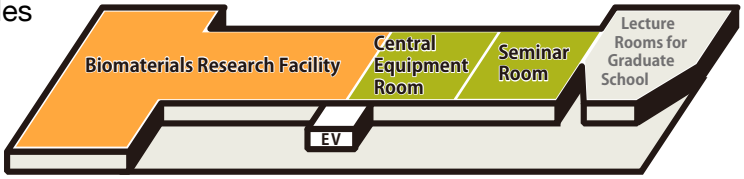
Multi-microplate reader SpectraMax Plus

Capable of detecting visible to ultraviolet absorption, fluorescence intensity, fluorescence polarization, time-resolved fluorescence and luminescence. It is used for DNA/RNA/protein assay and purity test, cytotoxicity test, etc.

Biomaterials Research Facility

Building 3
1st Floor

Analytical devices to examine microstructures such as biological tissues and dental materials and devices for the preparation of their samples are installed. Main instruments include precision analyzers such as transmission electron microscope, scanning electron microscope, micro-focus X-ray CT, and HS all-in-one fluorescence microscope, as well as a microtome for sample preparation, critical point dryer, freeze dryer, ion sputtering device, and vacuum vapor deposition apparatus. A scanning photoelectron spectrometer PHI X-tool (ULVAC-PHI) was installed with the subsidy for improvement of research facilities provided by the Ministry of Education, Culture, Sports, Science and Technology in 2013.



Microfocus X-ray CT SKYSCAN1275

It can nondestructively examine the distribution density inside the substances by X-ray irradiation and take CT images.

Field emission-type scanning electron microscope S-4800 (Hitachi)

High resolution can be observed at low accelerated voltages with high resolution FE-SEM. Super ExB to suppress charge-up or edge effect is mounted.

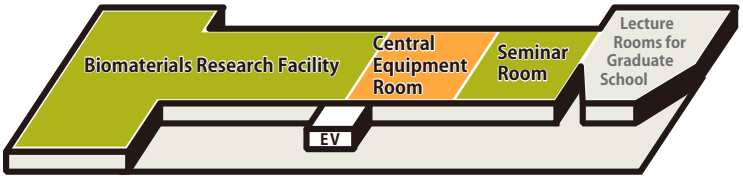
Scanning electron spectrometer PHI X-tool (ULVAC-PHI)

Photo-electron spectra released from a surface at a depth of about 10 nm are measured and information on surface chemical analysis is obtained such as surface composition and chemical bonding status.

Biomaterials Research Facility

Building 3
1st Floor

The facility is equipped with equipment to prepare specimens for use in research.



Distilled water/pure water purification machine (ADVANTEC)

Device to purify distilled water, ion-exchanged water, and pure water used for research.

Crash ice making machine CM-350AWE (Hoshizaki)

Crush ice machine for cooling samples, etc. in research.

Dry ice machine (ISIS)

Device to prepare dry ice for freezing samples and cooling samples during transportation

Dental biology facility

Building 3
Basement Floor

It is equipped with a gene introduction device, nucleic acid extraction device, Sanger sequencer, 454 GS Junior System (the next generation sequencer), etc. to conduct basic dental medicine research, mainly genetic analysis. A cell sorter to analyze gene expression and to examine the relationship with functional differentiation of cells is installed in the analytical equipment facility.

Sequence system GSjunior (Roche Diagnostics)

A bench-top size sequencer that enables analysis of bacterial genome information and human gene polymorphism/expression analysis.

Spiral plater EDDY JET2 (IUL)

Automatic plater capable of sucking a sample to a spiral smear on an agar plate by using a dedicated disposable microsyringe.

High-speed cooling centrifuge himac CR22G (HITACHI)

High-speed cooling centrifuge capable of using from 15 mL of conical tube to 1.5 L dedicated bottle by replacing rotors.

Animals Facility

Building 3
Basement Floor

Facility where laboratory animals are housed

About animal experiments

Animal experiments must be conducted not only following the scientific methods in general experiments but also in a way in which the life of laboratory animals is respected and unnecessary pain is not given. Matters related to animal welfare and animal management are specified in the "Act on Welfare and Management of Animals" (the Animal Welfare Act). The Animal Welfare Act specifies 3Rs in animal experiments (Reduction, Refinement, and Replacement) as "consideration when animals are used for scientific purposes."

1. Relevant rules

“Standards relating to the Care and Keeping and Reducing Pain of Laboratory Animals” by the Ministry of the Environment and the "Rules for animal experiments in Osaka Dental University" are stipulated in accordance with the "Basic guidelines for conduct of animal experiments in research institutions, etc." notified by the public notice of the Ministry of Education, Culture, Sports, Science and Technology, and show the points to be observed in planning and conducting animal experiments.

2. Self-inspection/evaluation report on animal experiments

Based on the public notice of the Ministry of Education, Culture, Sports, Science and Technology, "self-inspection and evaluation on animal experiments" are conducted.

3. Cross-validation program for animal experiments

External evaluation is performed for "self-inspection and evaluation on animal experiments."