

KANAZAWA University

- Environment/eco-technical special course,
Graduate School of Natural Science and
Technology-



金沢大学
KANAZAWA
UNIVERSITY

Kanazawa City



Kanazawa Univ.

Kanazawa City
Population: 400,000
Traditional Cultures

Position of Ishikawa



**ISHIKAWA
PREFECTURE**
Kanazawa



History of Kanazawa University

Origin

1862 Hikoso Vaccination Center

1874 Ishikawa Normal High School

1887 The Forth Higher School

1923 Kanazawa Medical College



1918 Ishikawa Youth Normal School

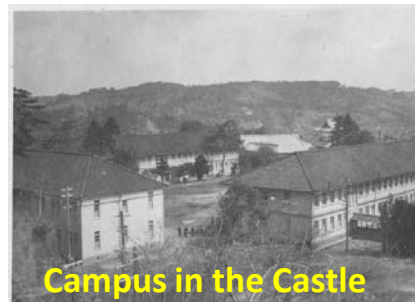
1920 Kanazawa Technical College

1949 Kanazawa University



2008 Three Colleges 16 Schools from 8 Faculties 25 Departments

2012 The 150th Anniversary of Kanazawa University



Campus in the Castle



Kodatsuno Campus



Kakuma Campus



Kanazawa University Kakuma Campus

To Nanto (Toyama Pref.)

To Tawara-machi
and Mt. Lozen

Central Area

- C1** Administration Office, Health Service Center, Organization of Frontier Science and Innovation
- C2** Information Media Center
- C3** Central Campus Store and Restaurant
- C4** Natural Science and Technology Hall 5
- C5** Incubation Laboratories
- C6** Organization of Frontier Science and Innovation
- C7** Low Temperature Laboratory
- C8** Advanced Science Research Center, Radiolotope Laboratory for Natural Science and Technology
- C9** Center for Regional Collaboration
- C10** Guest House
- C11** International House

North Area

North Area

- N1** Student Union Hall
- N2** Central Library, University Museum
- N3** General Education Hall 1
- N4** General Education Lecture Hall
- N5** General Education Hall 2
- N6** Human and Social Science Hall 1
- N7** Human and Social Science Lecture Hall 1
- N8** Human and Social Science Hall 2
- N9** North Campus Store and Restaurant
- N10** Human and Social Science Hall 3
- N11** Human and Social Science Lecture Hall 2
- N12** Human and Social Science Hall 4
- N13** Human and Social Science Hall 5
- N14** Machine Laboratory and Wood Workshop
- N15** Center for Educational Practice and Support
- N16** Swimming Pool
- N17** Center for Archaeological Research
- N18** North Clubhouse
- N19** Gymnasium
- N20** Energy Station

Central Area

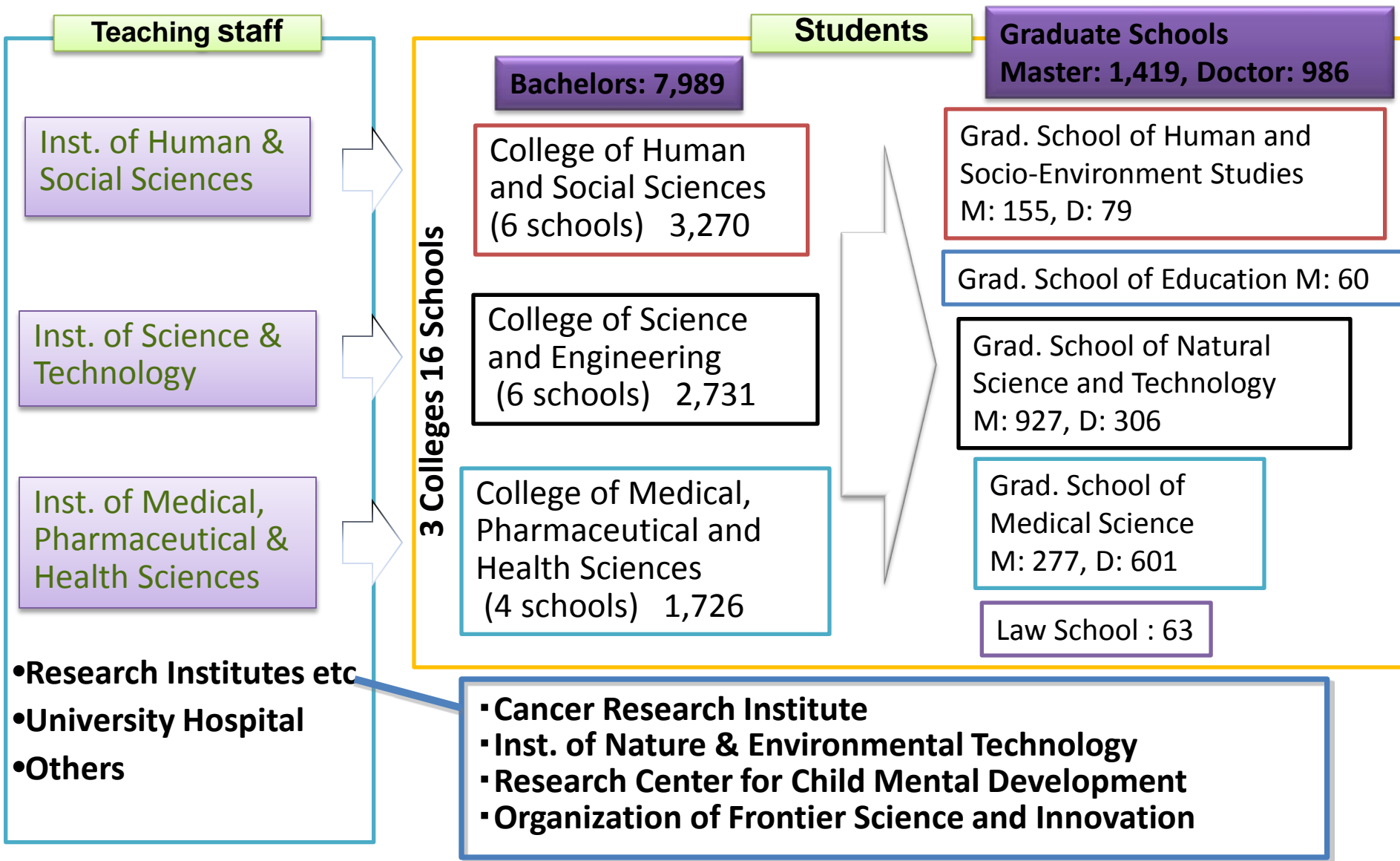
South Area

South Area

- S1** Natural Science and Technology Main Hall, Career Design Laboratory for Gender Equality
- S2** Natural Science and Technology Library, South Campus Store and Restaurant
- S3** Natural Science and Technology Hall 1
- S4** Natural Science and Technology Hall 2
- S5** Natural Science and Technology Hall 3
- S6** Cancer Research Institute
- S7** Environment Preservation Center
- S8** Venture Business Laboratory, Hard Ware Laboratory 1
- S10** Hard Ware Laboratory 2
- S11** Institute of Nature and Environmental Technology, Hard Ware Laboratory 3
- S12** Hard Ware Laboratory 4
- S13** Technical Support Center
- S14** Natural Science Lecture Hall
- S15** Student Dormitory

[Wide-area Map]

University Organization



1,209 Faculty, 413 Office Staff, and 1742 Medical Technical Staff.

Research in Kanazawa University

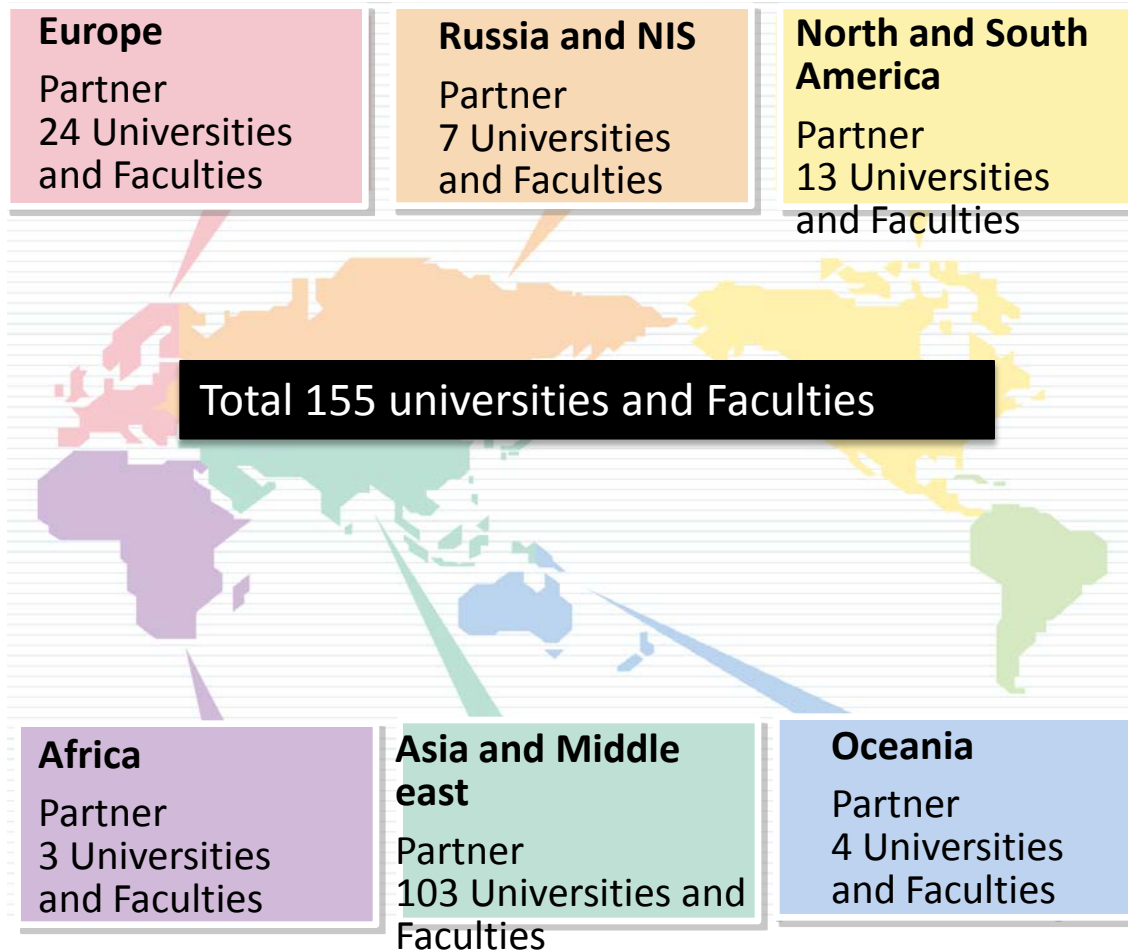
▫ Grants from outside university (2011)

Classification	Number	Unit:1,000 yen
Grants-in-Aid for Scientific Research	698	1,733,046
Grants from Joint Research	222	218,345
Grants from Commissioned Research	103	864,357
Endowments and Donations	2,738	1,369,971
Total	3,767	4,185,719



- Subsidy from the Japanese Government: **17,113 million** of yen
- Grand-in-Aid for Scientific Research is ranked the **18th** in Japanese universities.
- The number of paper published is **9,096** (in 2002-2012)
- Citation count is **99,875** (**20th-ranked** in 2002-2012)

International Exchange



As of May 16, 2012

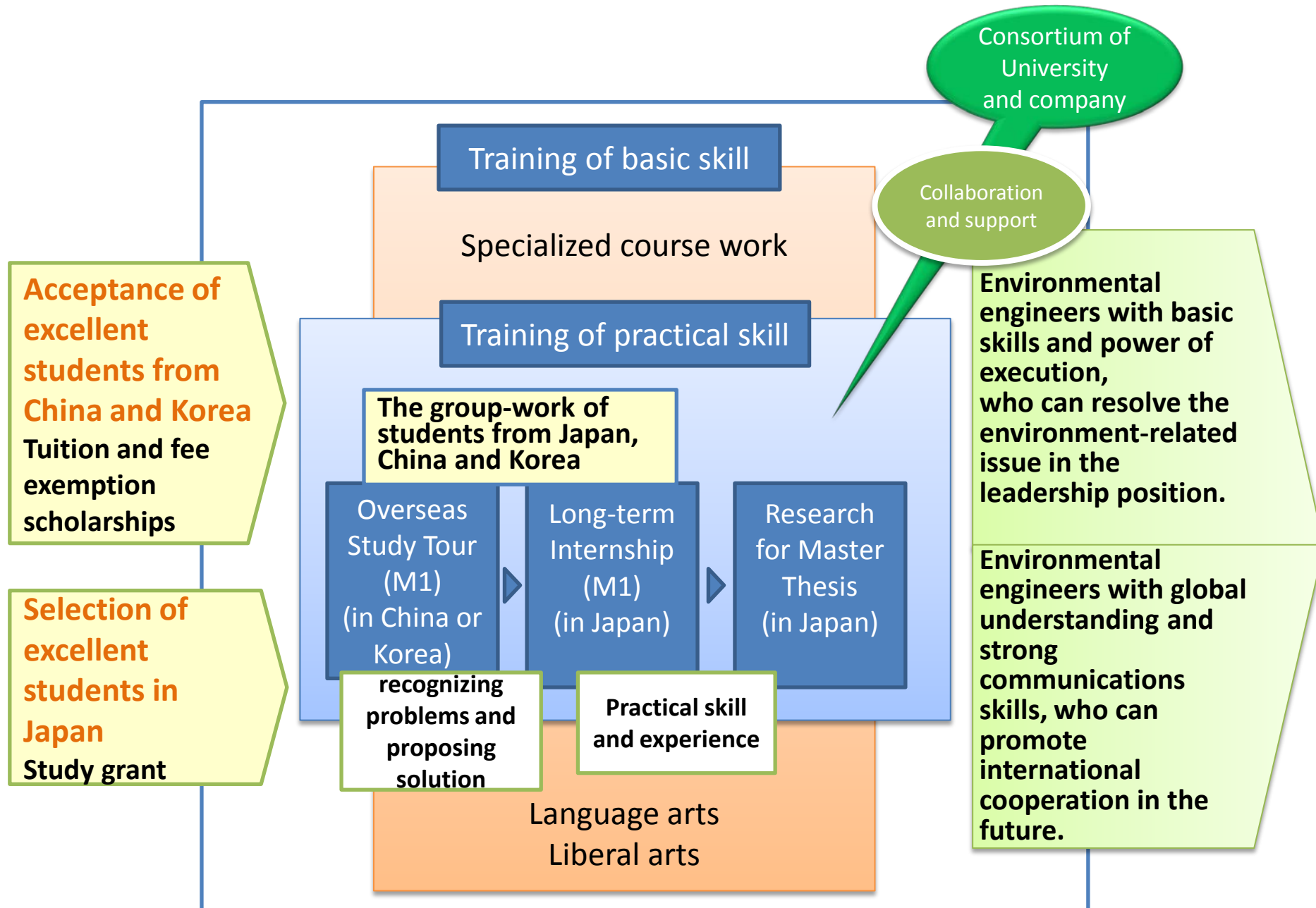
International Students in Kanazawa University

Classification	Undergraduate Students	Graduate Students (Master)	Graduate Students (Doctor)	Research Student Etc.	Total
Asia (except China)	21	58	102	26	207
China	33	99	53	27	212
Middle East	1	1	8	0	10
Oceania	0	0	0	6	6
Africa	1	2	6	0	9
Europe	1	0	1	23	25
Russia & NIS	0	0	7	1	8
Americas	0	0	1	6	7
Total	57	160	178	89	484

As of May 1, 2012

The Number of International Students is **484 from 39 countries.**

Environment/eco-technical special course



Features of Environment / Eco-technical Special Course

The group-work of students from Japan, China and Korea

Through study activities and communications together, students from three countries will get benefit of the cooperation between different countries.

The ability to find the environment-related issues through overseas environmental training

Through overseas environmental training in East-Asia, students can get better understanding of mutual environmental problems, and develop the ability in excavating problems in the field of environmental technology.

The ability to solve problems through long-term internship

To develop the ability in solving practical issues, through long-term internships in the companies in Japan.

Communication skills and the knowledge of environmental engineering

As an eco-engineer, it is necessary to develop specialized knowledge and communication skills. Further, the ability to grasp the perspective of social sciences and medicine is also required.

Outline of the selection



Curriculum

Research for Master Thesis , Seminar

Advanced Subjects

Air Pollution Control Engineering, Unit Operation for Atmospheric Environment , Atmospheric Chemistry, Technology for water quality control, Aquatic Environmental Chemistry, Physical Chemistry for Environment, Thermodynamic Analysis for Environmental Eng., Environmental Microbiology, Soil Analytical Chemistry, Environmental system engineering, Environmental Risk Assessment, Environmental Planning, Advanced Environmental Science and Technology

Basic Subjects

Environmental unit operation ,Environmental Analysis and Experiment, Basic of Environmental Science, Introduction to Environmental Engineering

Liberal Arts

Environment and Sustainable Society, Environment and Health, Environmental Administration, Environmental Management

Language Arts

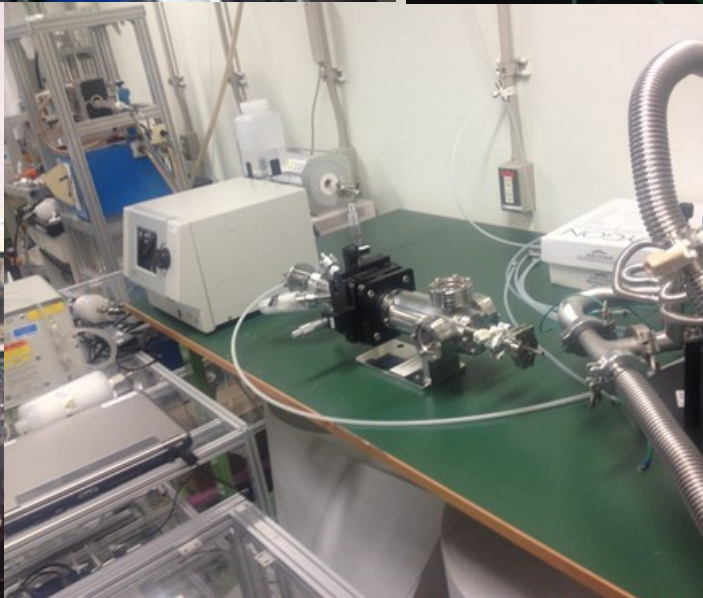
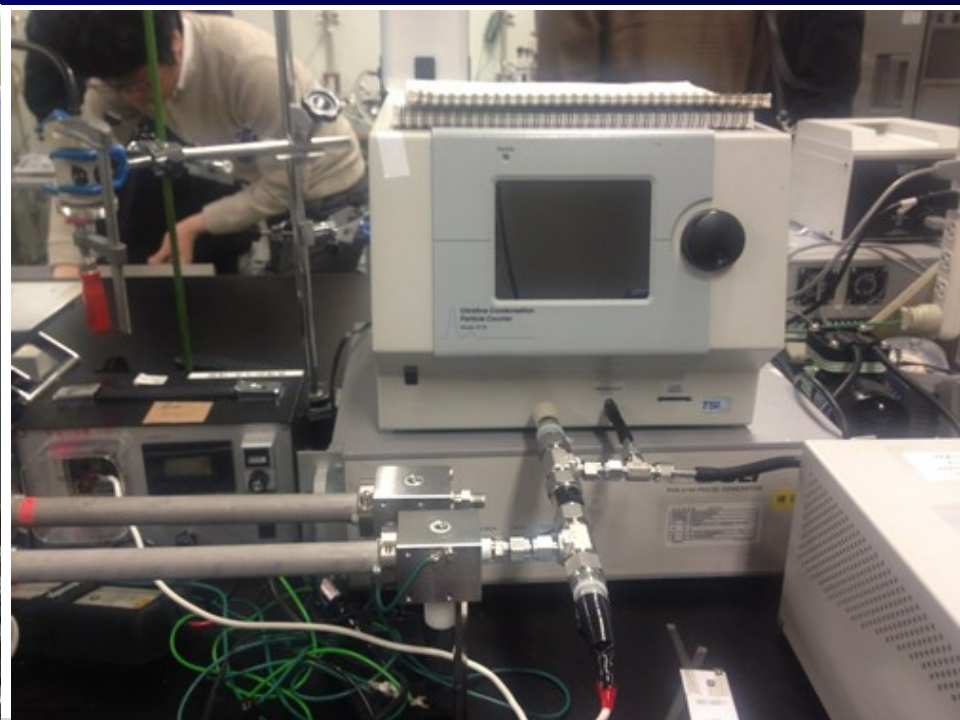
English for Environmental Science and Technology, Advanced English for Environmental Science and Technology, Japanese

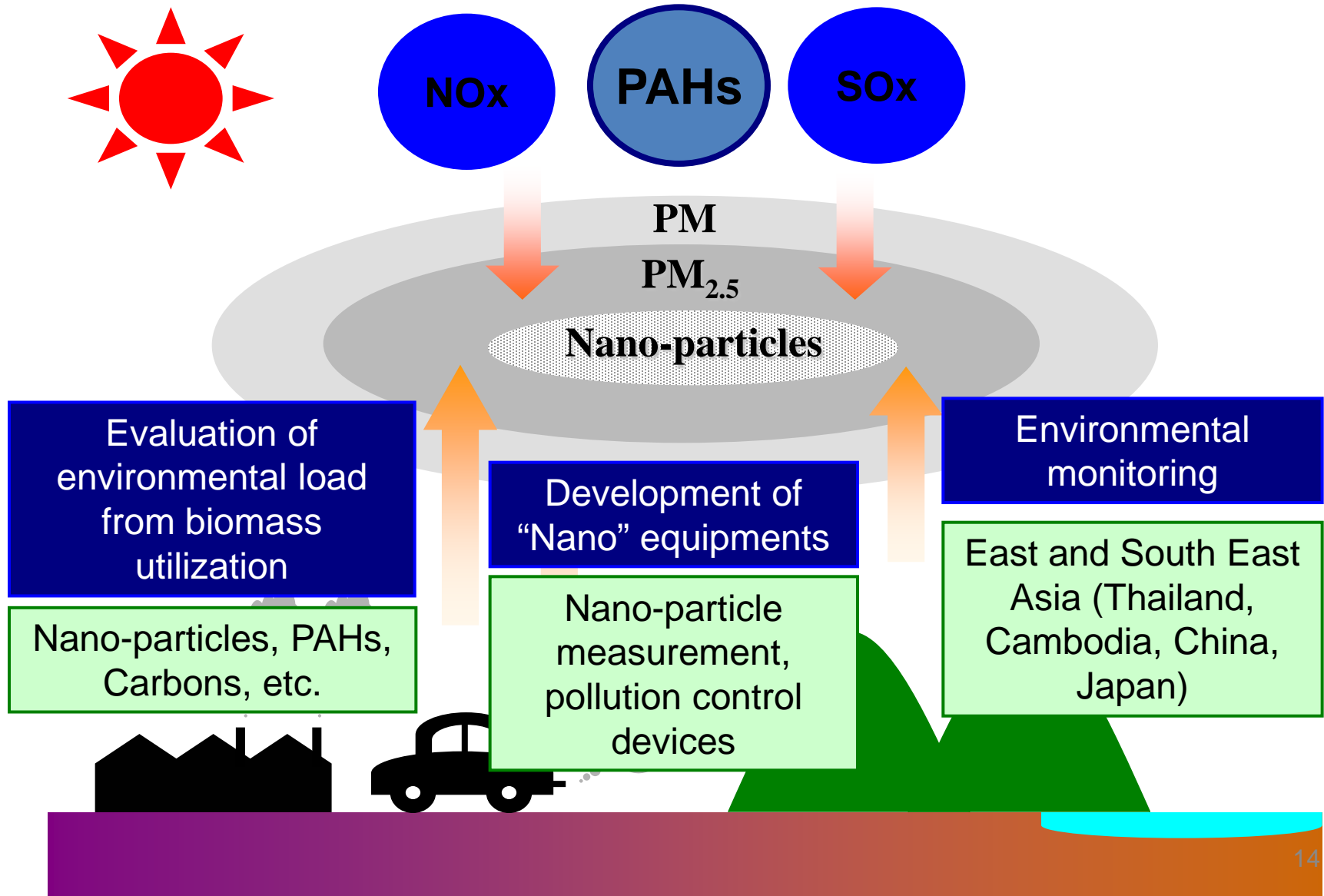
Internship

Overseas Training

Basic Subjects in Each Department.

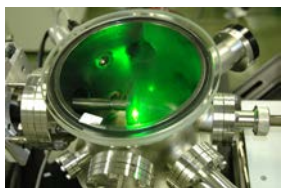
Research activities



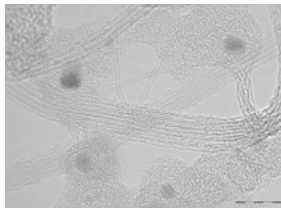


NANOPARTICLE

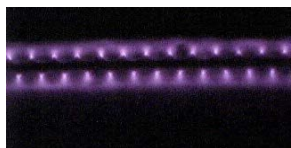
We develop synthesis techniques for nanoparticles by novel aerosol processing which can be used in the various fields such as cosmetics, foods, catalysts, medicine, structural materials, electronics and so on.



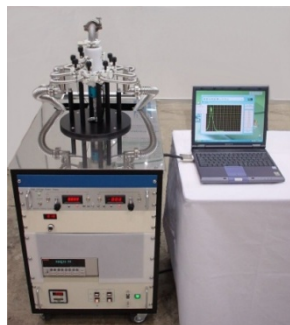
Laser Ablation



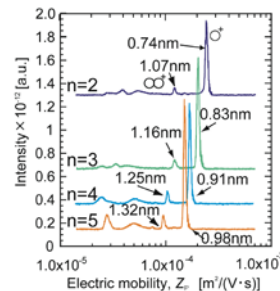
Carbon Nanotube



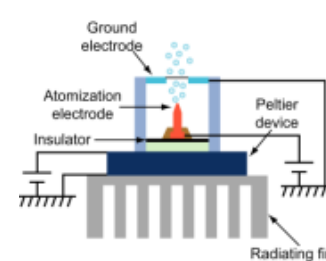
Microplasma



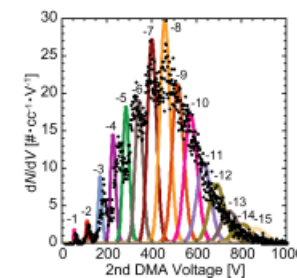
Ion spectrometer



Aircraft measurement



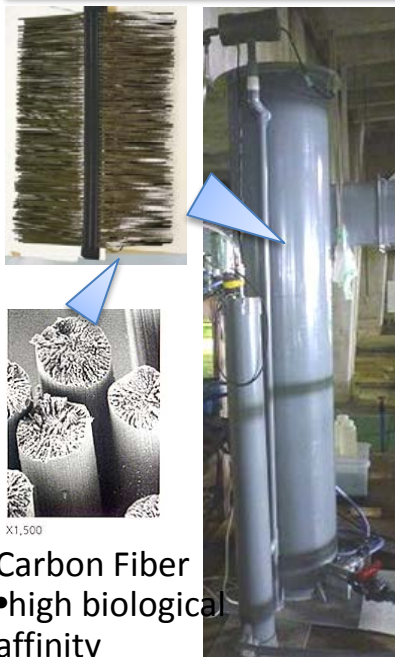
Nano-Spray device



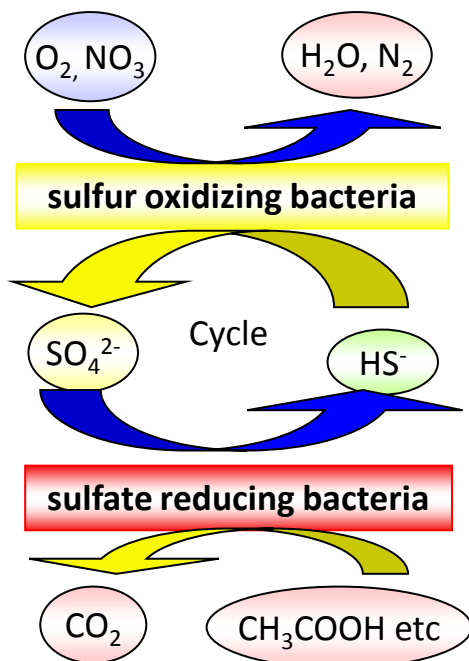
Various atomization techniques and the generation of highly charged nanodroplets can be applied for the analysis of air quality as well as water quality. Aerosol technologies are applied for the measurements and control of atmospheric and water pollutants for the innovation of clean technology. We are also involved in the campaign of aerosol measurement in East Asia.

ENVIRONMENTAL

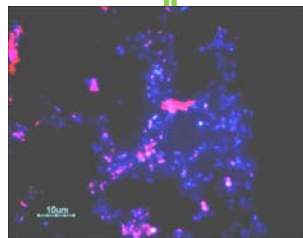
Wastewater Treatment



Carbon Fiber
 •high biological affinity
 •high SS Trapping

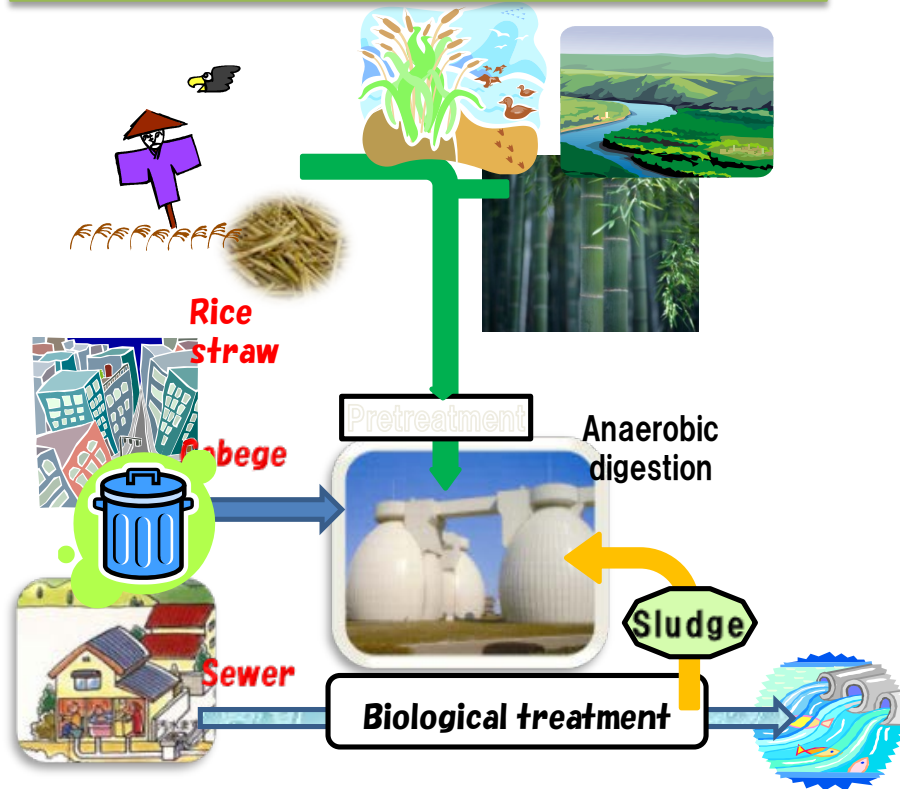


Anaerobic treatment of wastewater with low temperature, high SS or high sulfate using an biological Reactor equipped with swinging carbon fiber
 Nitrogen removal using sulfate reducer, sulfate oxidizer and Anammox



Microbial Population Analysis

Anaerobic co-digestion

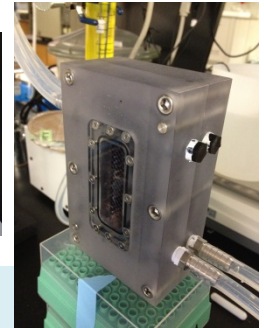
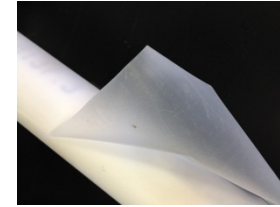
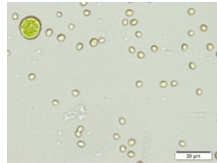
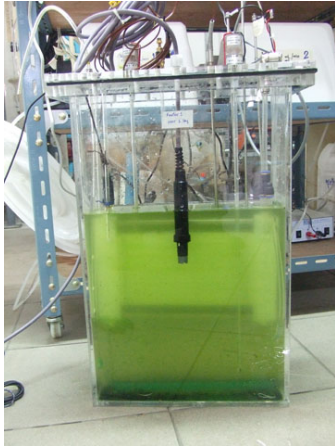


Small scale co-digestion of sewerage sludge and biomass.
 Pretreatment of sewerage sludge
 Pretreatment of Wood and plant biomass

Energy & Biomass Production from Wastewater

1. Membrane Photobioreactor (MPBR) process

- **High-rate CO₂ capture** by concentrated microalgae cultivation
- Production of **microalgae biomass for biofuel** and bioenergy
- **Nutrients removal** and water reclamation as tertiary treatment



2. Forward Osmosis (FO) membrane process

- **Nutrients concentration** for high algae productivity in subsequent MPBR
- Simultaneous osmotic **power generation / water recovery** using treated sewage

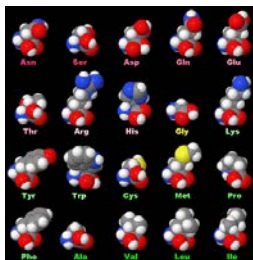
Health Risk in Reused Water in Asia

3. Fate of Antibiotic-Resistant Bacteria in water environment in Asia

- **Prevalence** of antibiotic-resistant bacteria **in water environment**
- **Population dynamics** in sewage collection and treatment



Amino acids



+ *Fatty acids*

→ *amino acid surfactants*

Biodegradable
Low irritant

Green surfactant

Synthesize and Characterization

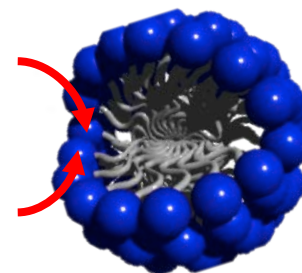
Water purification by molecular assembly

Basic property and Application



*Alkyl
halides*

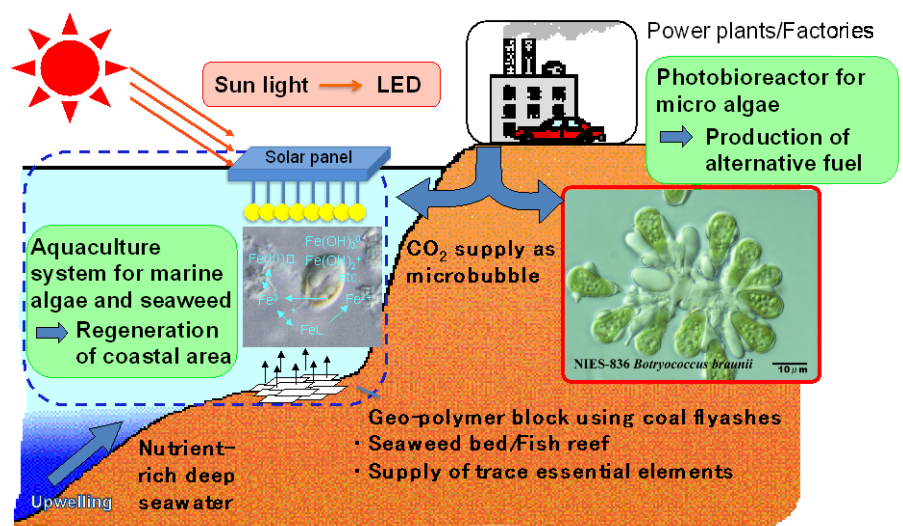
Radioactive cesium



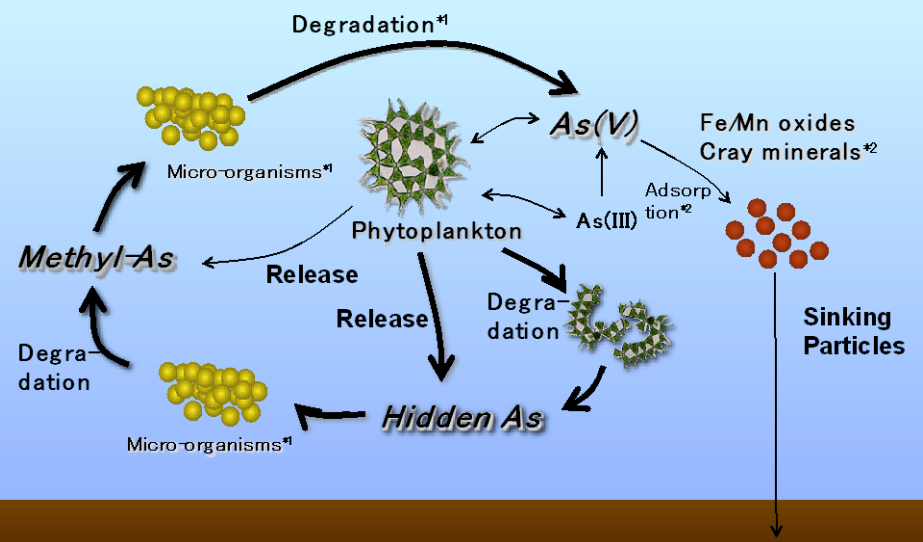
Surfactant science and technology

- Synthesize and characterization of novel green surfactant based on amino acids.
- Investigation of self assembled behavior of amphiphile with a view to purify water.

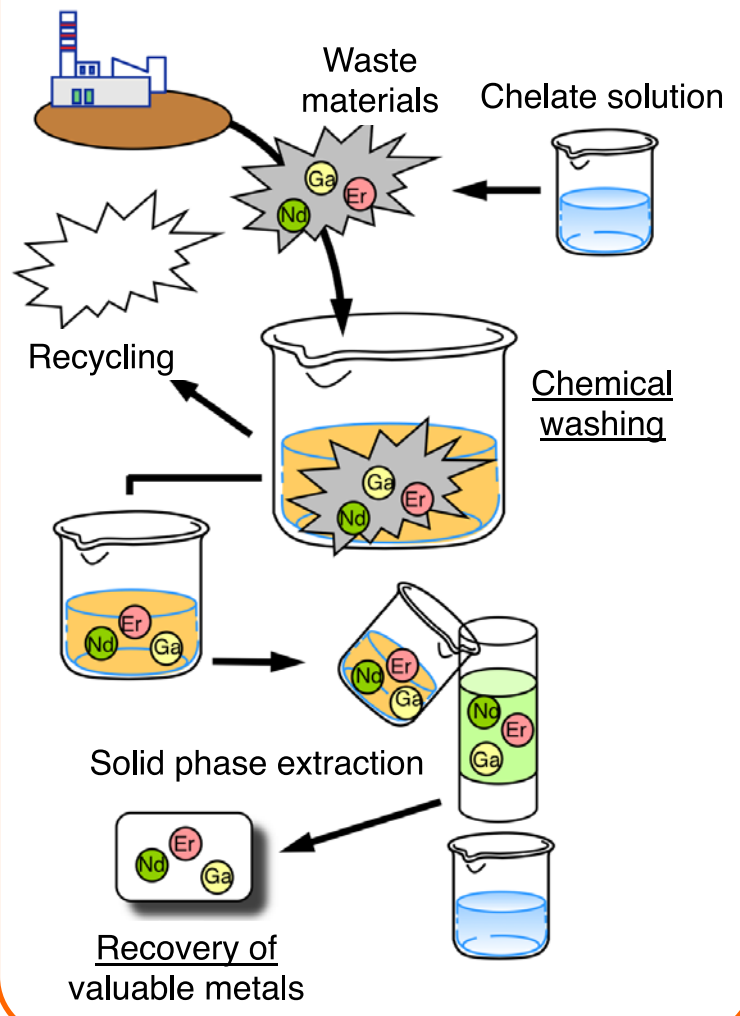
Role of trace elements for regulation of algal biomass

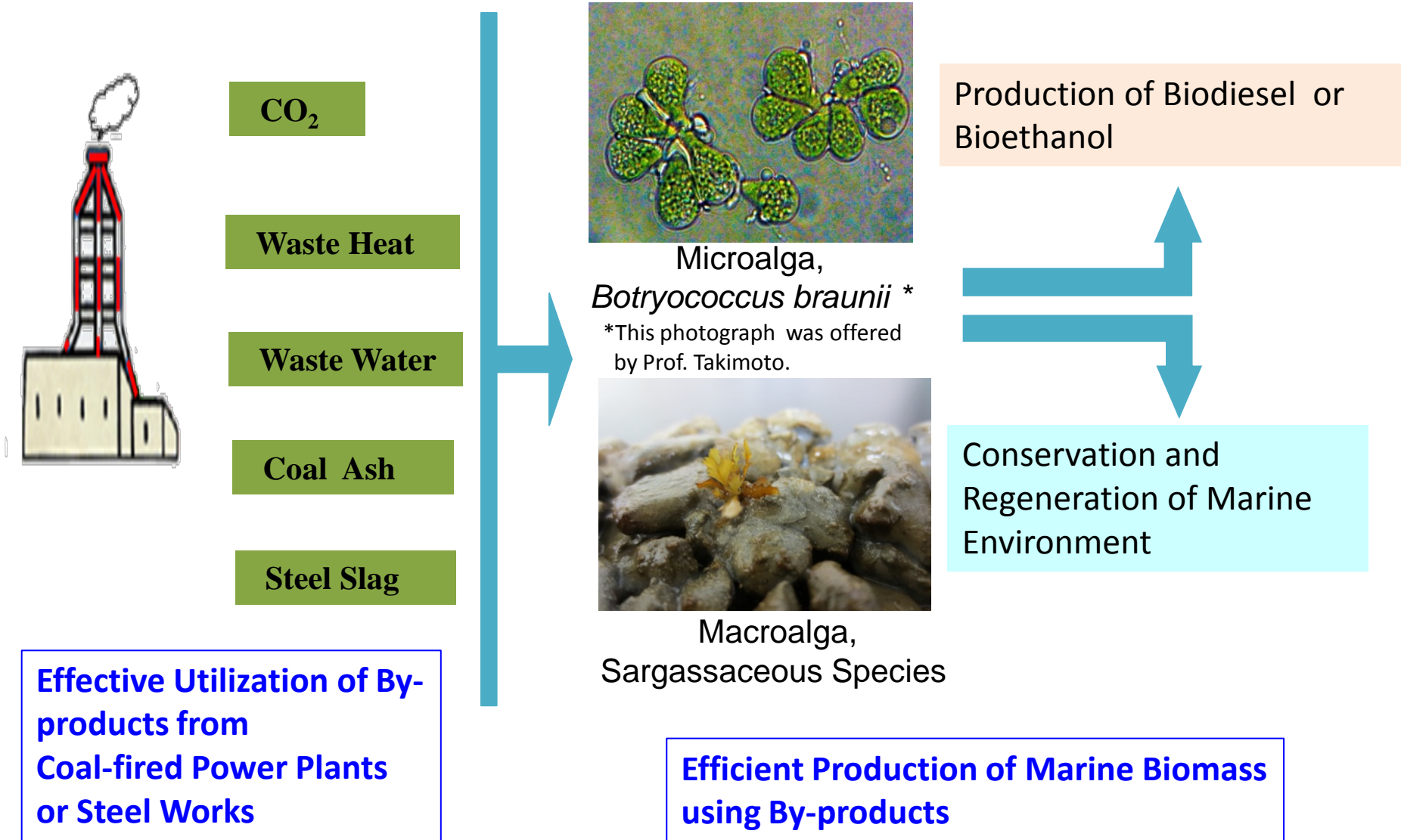


Speciation change of trace elements in natural waters

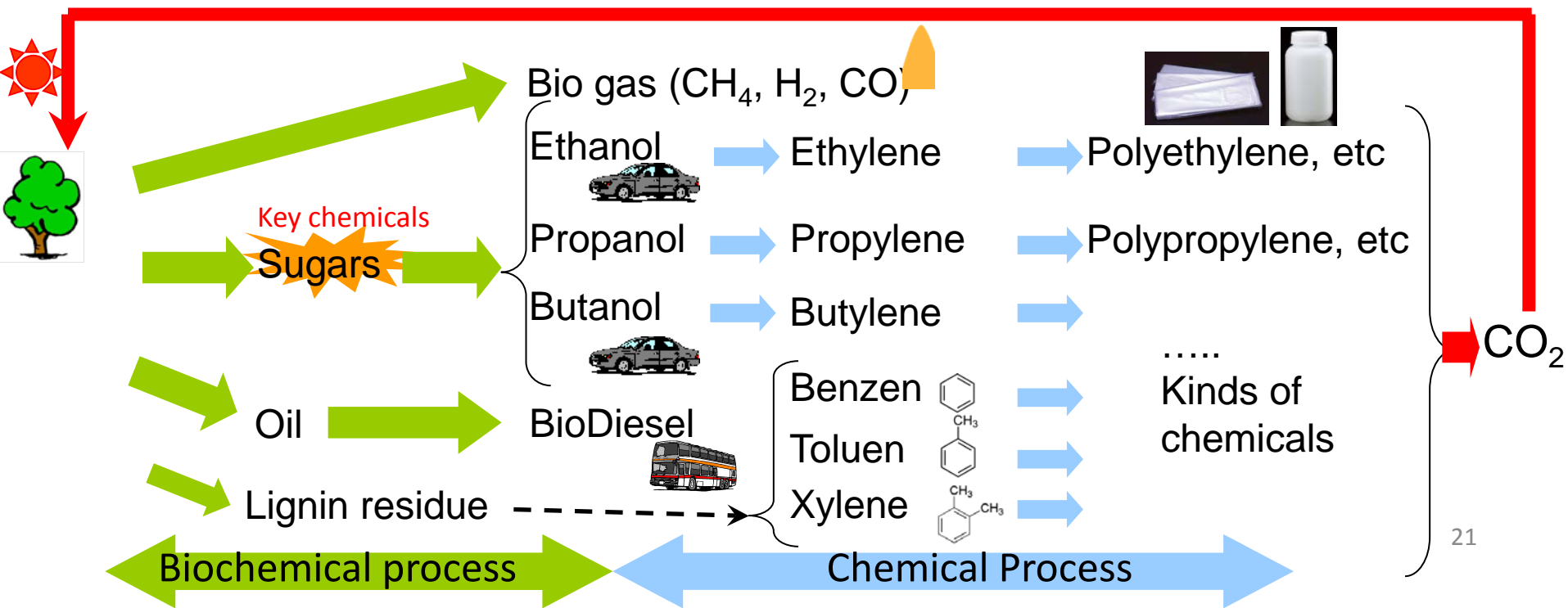


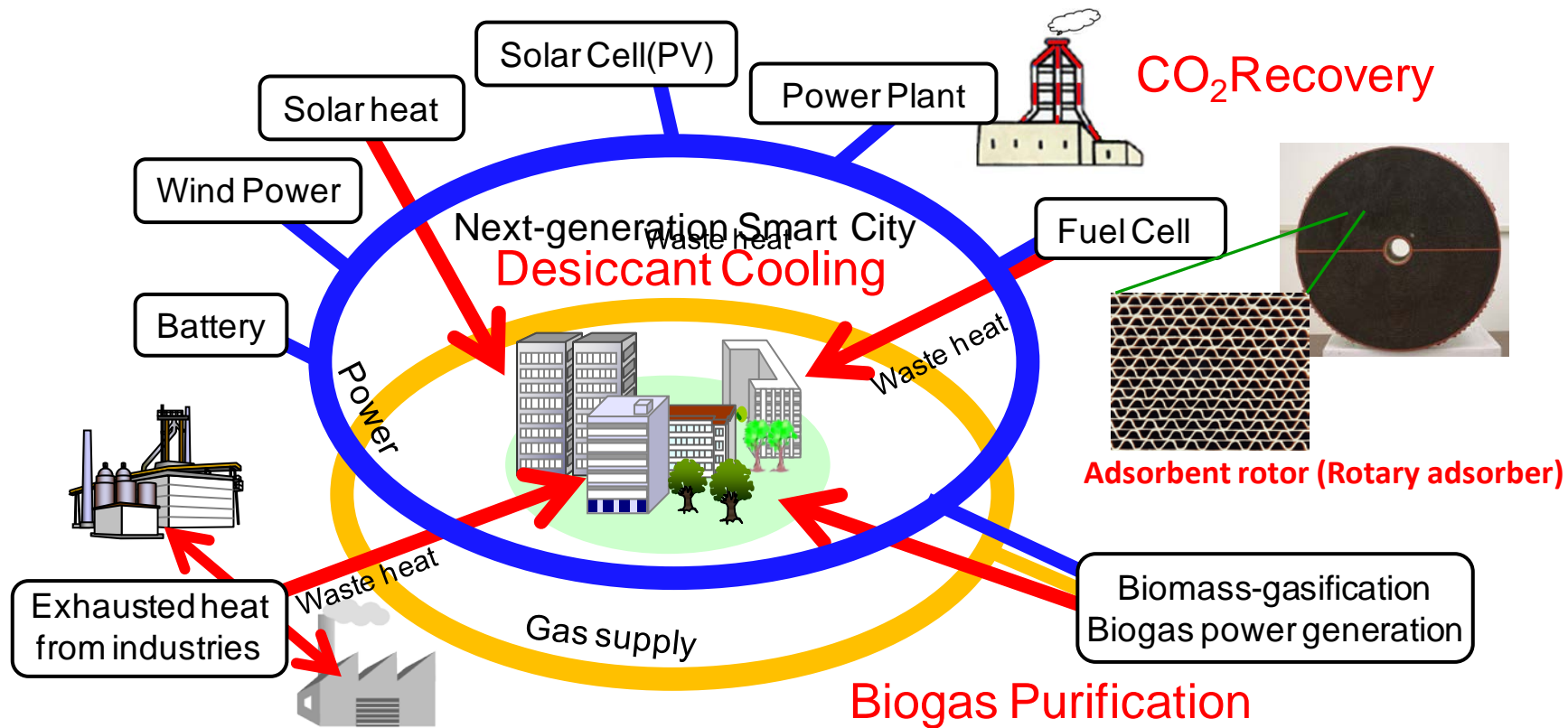
Chemical washing for separation of valuable metals from waste materials





Biomass refinery Technology





“Adsorption technologies” for effective use of a low-temperature heat

- Adsorption Desiccant Cooling/Dehumidification process
- Thermal Swing Adsorption for CO₂ recovery, Biogas purification and VOCs removal

Visit to companies and municipal sites



2011 Oversea Internship (Beijing, 09/2011)

日中韓環境・エコ技術特別コース「海外環境研修」

北京の訪問期間：8月30日～9月7日（9日間）



2011 Oversea Internship (Beijing, Sept. 2011)



2012 Oversea Internship (Korea, 08/2012)

日中韓環境・エコ技術特別コース「海外環境研修」
ソウル・光州の訪問期間：8月20日～8月26日（7日間）



2012 Oversea Internship (Korea, Aug. 2012)



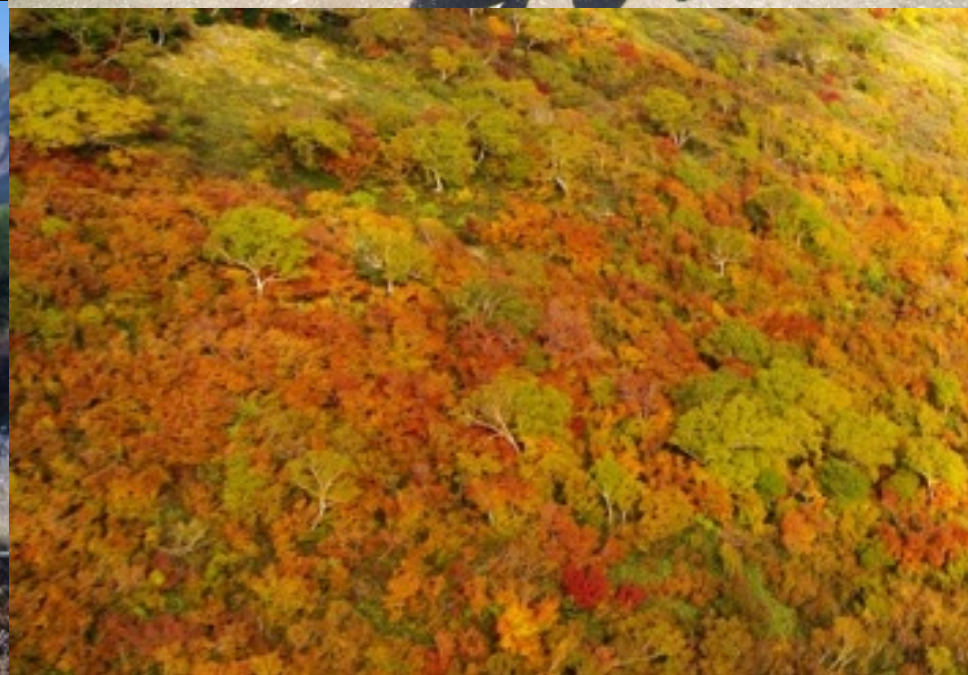
Internship in Japanese companies (several weeks)



Internship in Japanese companies (several weeks)



Tateyama Trip (Oct. 2011)



We are really waiting for your application.

THANK YOU FOR YOUR KIND ATTENTION!

<http://www.se.kanazawa-u.ac.jp/ecotechgp/index.php>