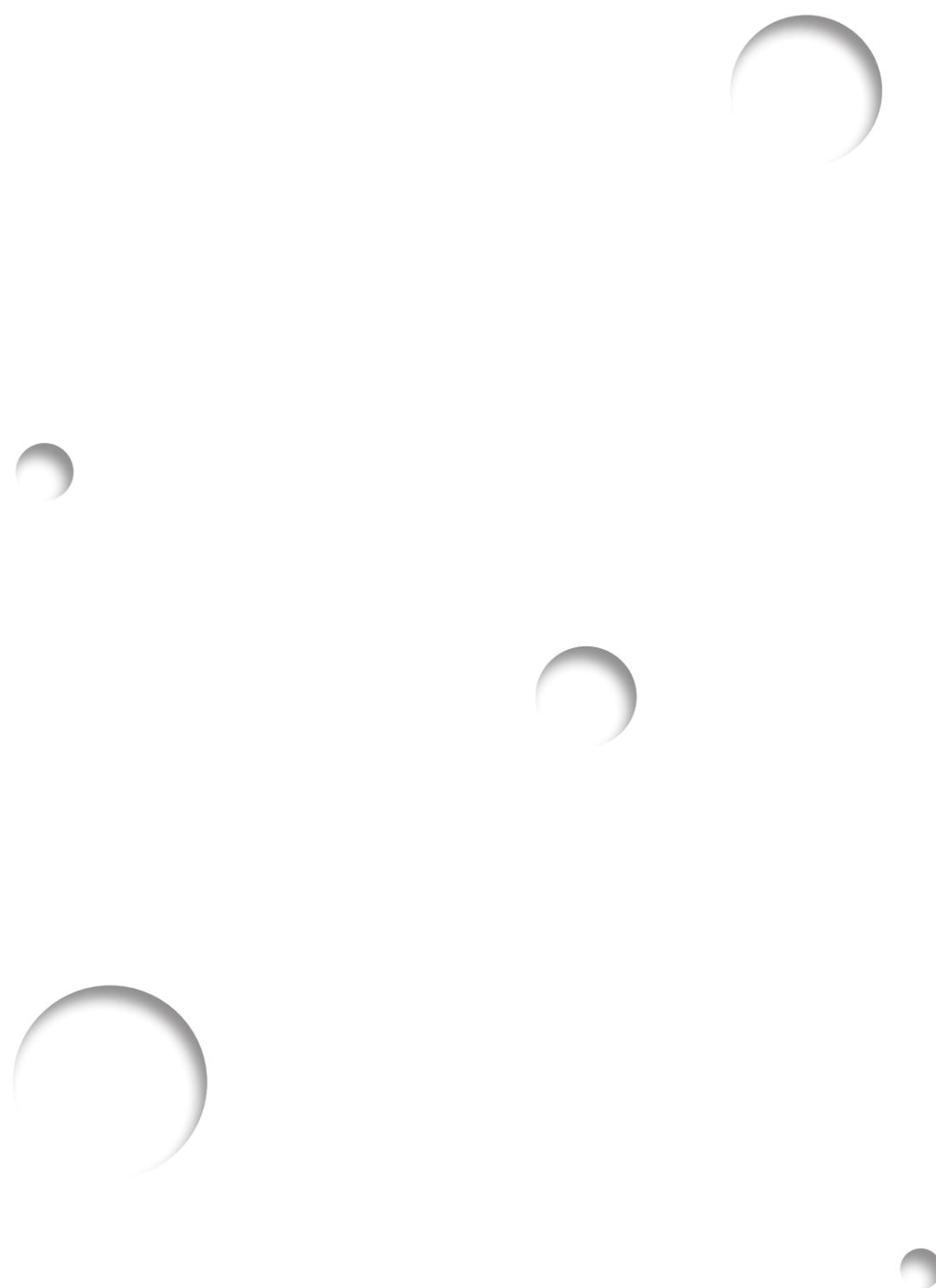




www.kbsi.re.kr

KBSI
KOREA BASIC SCIENCE INSTITUTE

World-class
Research Platform



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KBSI User Facilities



Connecting
the Basic Science Infrastructures!

KBSI is the platform that connects research facilities, research equipment and researchers.



World-class
Research Platform

***KOREA
BASIC
SCIENCE
INSTITUTE***



Innovating
the Basic Science Infrastructures!

KBSI is the world-class institute leading innovation of research facilities and equipment.

Beginning
the Era of Strong Nation
of Science and Technology!

As an advanced platform for basic research, KBSI explores the future for science and technology through the passion and challenges to new frontier.

Greetings



KBSI will move forward to become “the world-class basic research infrastructure institute leading the innovation of research facilities and equipment.”

The importance of cutting-edge research equipment and facility is increasingly recognized for the future development of science and technology as well as global research competitiveness.

In this era of creation and convergence paradigm, Korea Basic Science Institute (KBSI) is “a platform for global basic research”, where research support and joint-research are performed by exceptional personnel using cutting-edge equipment.

KBSI’s network, consisting of Daedeok Headquarters, Ochang Headquarters, and regional centers is achieving outstanding research accomplishments thanks to our world-class analysis support service and scientific analysis technology. For better use of national research equipment, we are also taking the lead in effective investment in national research equipment and its promotion for public use, by preventing overlapping investment in research equipment and introducing public use policies for the research equipment.

As the leading institute for national research equipment development, our plan is to lay the foundation for the growth of the domestic research equipment industry, by establishing policies for domestic manufacturing of research equipment, and developing and promoting research equipment.

With the cutting-edge research equipment, and the public use of the equipment, KBSI will move forward to become “the world-class basic research infrastructure institute leading the innovation of research facilities and equipment”.

Thank you for your interest and support.

Kwang Sik Lee, PhD
President of Korea Basic Science Institute



History

**1988
~
1999**

- 1988. 08. Korea Basic Science Center (KBSC) established as an affiliate of Korea Science & Engineering Foundation
- 1992. 03.- 04. Four local Centers (Seoul, Busan, Daegu, Gwangju) established
- 1999. 05. Established as a corporate body
- 1999. 12. Jeonju Center established

**2000
~
2005**

- 2001. 01. Name changed to Korea Basic Science Institute (KBSI)
- 2001. 11. Chuncheon Center established
- 2005. 05. Suncheon Center established
- 2005. 10. 'National Fusion Research Institute' established affiliated organization

**2006
~
2015**

- 2006. 04. Ochang Center established
- 2006. 05. Gangneung Center established
- 2008. 04. Jeju Center established
- 2009. 08. National Research Facilities Equipment Center (NFEC) established
- 2012. 12. Western Seoul Center established

Vision & Function

MISSION

Conduct R&D on research facilities & equipment and analytical S&T, joint research and support for basic science promotion

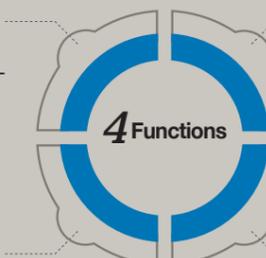
VISION

The world-class basic research infrastructure institute leading the innovation of research facilities and equipment

MAIN FUNCTIONS

Research support and joint research through construction and operation of high-tech large research equipment

Development of analytical equipment and technologies through analytical science researches



Exclusive responsibility for general management of national research facilities and equipment

Training of specialists for research equipment and creative future talents

PROMOTION STRATEGIES

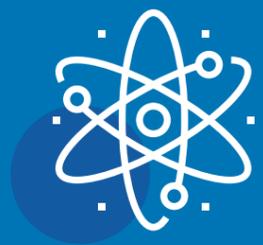


Support for
Advanced
Analytical Research
and Operation of
Leading Edge
Equipment



High Resolution Bio-Transmission Electron Microscope

1. Analytical Research Support



• Bioconvergence Analysis

We perform research and development, research support, and collaboration on analytical science through the bioconvergence of analytical techniques, and we pursue development of new technologies on biology field such as virus, diseases, medicines using high-tech analytical facilities and convergence technologies.



• Environmental & Material Sciences

We establish world-class infrastructures on the property of material research field, nanomaterial surface analysis field, and earth environment research field. And we lead analysis support and project performance that can solve social problems such as next generation energy, detailed analysis of nanomaterial, measurement of living radioactivity and safety of foods.



• Scientific Instrumentation

We continuously accumulate technologies for research facilities by establishing a network of research facilities development that connects research facilities production companies and their customers such as universities and government funded research institutes related to the development of domestic research facilities. We also lead the development of domestic research facilities with the networks between industry, academy, research institute and government.

Bioconvergence Analysis

Biological Disaster Research / Daedeok Headquarters

Design problem-solving technologies against microorganisms that cause disaster in the fields of human and animal disease industry, agriculture, and aquaculture, such as ecological analysis of microbes, analysis of viral fish disease defense mechanism, and rapid concentration and sensitive detection of foodborne pathogenic viruses

▶ Representative Research Case 1

Drug & Disease Target Research / Daedeok Headquarters

Development of mediate research and related analytic technology that could be applied on diagnosis, treatment, and prevention of diseases such as discovering target protein related with cancers, metabolic diseases, and contaminations through proteomics analysis; determining the reason of diseases; and verifying the proof of action of new medicines through the target protein function research

Protein Structure Research / Ochang Headquarters

Verification of diseases related protein-protein interaction mechanisms and discovery of the structure based new medicines using nuclear magnetic resonance (NMR) and X-ray diffraction method

Bioimaging Research / Ochang Headquarters

With 7 T & 3 T human MRI, and 9.4 T & 4.7 T animal MRI, newly developed fast scan technologies and higher contrast image processing methods can apply to disease diagnosis and bio-phenomena research

Biomedical Omics Research / Ochang Headquarters

Performance of researches for diagnosis, treatment and prediction of diseases by establishing the OMICs research platform using high-resolution mass spectrophotometer and analyzing the biomaterials that consist human body such as protein and metabolites

Space-Time Resolved Molecular Imaging Research / Seoul Center

Establishing infrastructures of femtosecond laser spectrophotometer, super resolution optical and electro microscopes, and imaging mass spectrometer; and performance of studies on space-time distribution of molecules in bio/nanomaterial, dynamics image analysis technologies and related facilities development

Advanced Aging Science Research / Gwangju Center

In order to obtain critical results for degenerative disease and regeneration through collaborative research in university and research institutes, we carry out the supporting of age-related research and construction of the infrastructure for utilization of an aging research cluster

▶ Representative Research Case 2

Disease/Specific Molecular Imaging / Chuncheon Center

Convergence and research field, in which the images produced reflect cellular and molecular pathways and in vivo functional mechanisms of disease in living subjects, of suggesting a direction for early diagnosis, treatment and prevention of diseases to understand characteristics of diseases and discover new diagnostic, therapeutic and preventive strategies at the early stages for the treatment of human diseases

Marine Biology Research / Jeju Center

Performance and supporting of high-quality researches about biomedical manufacturing technology and eco-friendly environment recovery of marine organisms via comprehensive understanding and development of marine biology

Omics System Research / Western Seoul Center

Discovery of biomarkers for diagnosis/treatment/prevention of diseases and performance of research for verification of metabolite mechanisms and molecular network by establishing the integrated metabolites analysis platform and applying metabolite profiling technology on diseases/medicines/food/environment fields

resolution second ion mass spectrophotometer, and performance of analysis support and convergent collaboration research for earth environment researches and solving of small and medium industries, national and social problems such as geological structure, topography, age dating of cultural properties, determination of food origin, establishment of the analysis system for national disaster reaction, analysis of environment radioactivity, etc.

Advanced Nano-Surface Research / Daedeok Headquarters

Development of the surface and interface analysis for future electronics, environmental materials and bio fusion through in-situ nano-analytic system

▶ Representative Research Case 3

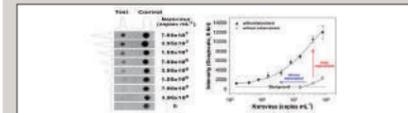
▶ Representative Research Case 1 Development of '3D paper kit' for norovirus on-the-spot detection and diagnosis

Detecting performance improved 100 times more than the previous commercial norovirus POCT kits by the creation of an innovative three-dimensional fluid paths that use cost-effective paper and a simple sliding mechanism. This platform technology can be applied to detect any other desired pathogenic viruses or biomarkers.



Contents and operating mechanism of the 3D paper chip

Catalyst property of gold nanoparticles utilized to amplify the detection sensitivity



Results of norovirus detection test

▶ Representative Research Case 2 Photoexcited porphyrins as a strong suppressor of β -Amyloid aggregation and synaptic toxicity

Photoexcited porphyrin molecules inhibit β -amyloid aggregation and rescue postsynaptic toxicity and behavioral defects in the *Drosophila* Alzheimer's disease model under blue light

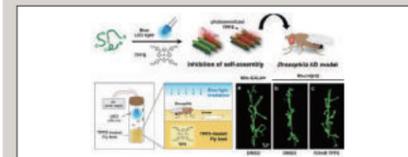
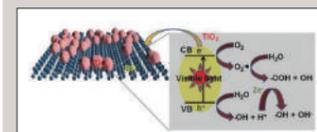


Diagram for inhibition of A β self-assembly into fibril ex vivo and A β synaptic toxicity by blue LED light-sensitized TPPS using *Drosophila* Alzheimer's disease model

▶ Representative Research Case 3 Stable semiconductor black phosphorus (BP)@titanium dioxide (TiO₂) hybrid photocatalysts

Making of black phosphorus (BP)-TiO₂ hybrid photocatalyst and solving of the unstable moisture issue of BP by replacing metal oxide particles such as TiO₂ with a simple synthesis method



Suggested schematics of photocatalytic mechanism for BP@TiO₂ hybrid photocatalyst under visible-light irradiation

Environment Risk & Welfare Research / Seoul Center

Performance of analytical support and collaborative researches to manage hazardous materials and to cope with environmental disasters through development of analytical technology for hazardous organic/inorganic environmental substances and research on related biological/ecological effects of them

Molecular Materials Research / Busan Center

Research for the green energy storage materials, such as improving lithium ion secondary batteries, examination of the mechanism, and modification of the present cathode/anode problems by using the surface reforming and nano-scale materials synthesis technology

Functional Materials Research / Daegu Center

Characteristic analysis and developments of molecular sensing materials, X-ray metrology science, and performance of initiative actions for advanced nano and molecular convergence imaging laboratory to outperform others toward advanced functional materials analysis research center

Nano & Carbon-based Materials Research / Jeonju Center

Performance of convergence analysis and properties research on nanomaterials and carbon-based materials

Energy Materials Research / Suncheon Center

Convergence research field of developing diverse materials that can improve the utilization efficiency of energy resources to resolve global energy and environmental issues

Functional Interface Science / Western Seoul Center

Performance of research, analysis support and collaborative researches to improve performance and develop advanced materials through interface research of functional materials based on development of core analytic equipment/technology as well as installation/operation of high-tech research equipment for performance improvement of functional materials in energy and environment material/system fields

▶ Representative Research Case 4

Scientific Instrumentation

Instrumentation Development Support / Daedeok Headquarters

Performance improvements and maintenance of research equipment by supporting the electronic circuit design and the machinery processing in industries, universities and research institutes

Optical Instrumentation Development / Daedeok Headquarters

Development of core optical component equipment for research facilities and next-generation convergent microscopic system in visible light and UV/X-ray range through ultraprecision machining of aspheric optical lens under nanometer level through establishment of ultraprecision machining and measurement equipment and developments

▶ Representative Research Case 5

Spin Engineering Physics Research / Daedeok Headquarters

Establishment of high magnetic field environment using a low temperature superconductor, high temperature superconductor and electrical conductor, and development of measurement facility for property measurement from cryogenic temperature (1.5 K) to high temperature (1000 K) resulting in the study of new material

Mass Spectrometry and Advanced Instrumentation Research / Ochang Headquarters

Convergent research through establishment of the standard for performance evaluation of research facilities and development of high-tech mass analysis related core technologies and research facilities such as TOF-SIMS and portable mass analyzer

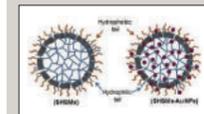
Ion Beam Research / Busan Center

Support of material modification research fields using developed versatile ion beam research platform that can control experimental circumstance (injection depth, dose, sample temperature) and development of ion beam accelerator with ion irradiation chamber

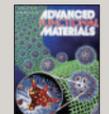
▶ Representative Research Case 6

▶ Representative Research Case 1 Nanocapsules for co-treatment of oil/water separation and water purification

Synthesis of silica micelles (hydrophilic core@amphiphilic shell) and their multiple applications such as oil/water separation and pollutant purification, and an ultrahigh loading capacity of enzymes with significant stability



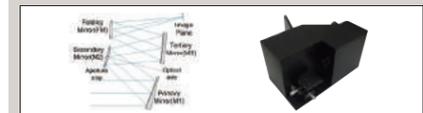
Schematic structure of silica micelles composed with hydrophilic core@amphiphilic shell



Cover picture of Advanced Functional Materials 2015, 25(38)

▶ Representative Research Case 3 Development of airborne payloads for remote sensing of coastal area

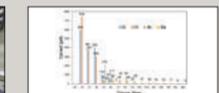
Design and development of EM model of airborne payloads specialized in domestic coastal areas that can contribute to national environment and safety by remotely observing water temperature, color change, ecosystem and disasters



Airborne TMA fore optics for remote sensing of coastal area; Optical layout (left), Optomechanical module (right)

▶ Representative Research Case 3 Provision of ion beam services that correspond to the requirements of customers

Performance of collaboration with industry, university and institute for research on semiconductor/renewable energy/nano bio/extreme environment materials by developing and operating of ion beam accelerator



2. Development of Analytical Technologies

We develop high-end analytic technologies, which are required for solving social problems such as diseases, disasters and calamities; and global issues such as environmental contamination, energy and climate changes.



| Standardized Technology for Discriminating the Geographical Origin

Development of the integrated analysis technology and standardization system to discriminate the geographical origin of various agricultural foods distributed in Korea

| Analytical Technology in Disaster Science

Research of scientific analysis techniques to predict, prevent, and solve the natural disaster and accidents that can occasionally occur

| Bio-imaging Technology for Early Disease Diagnosis

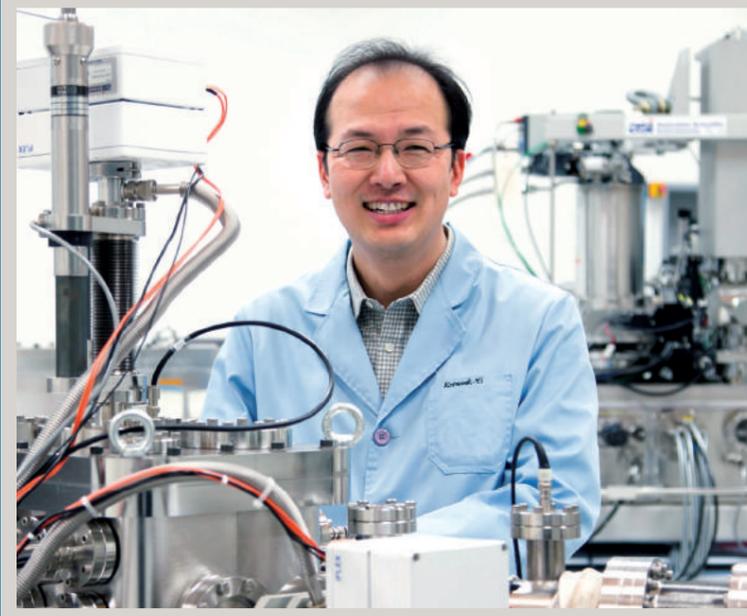
Research on imaging of early disease progression and investigation of relationship between myocardial necrosis and successive inflammatory response for optimal treatment of Myocardial infarction (MI)

| Culture Property Preservation and Analysis Technology

Provision of scientific information about origin, mobility and culture exchange of the archeoanthropine through isotope and age-dating research on archaeological relics and archeoanthropine

| Analytical Techniques using Biochemical Forensic Biomarkers

Development of scene-applicable analytical techniques using biochemical forensic biomarkers for fast, accurate and portable crime scene investigation



3. Operation of Leading Edge Equipment

KBSI develops cutting-edge analytical technology to extend capability of analytical services and develops high-tech research equipment and related elementary technology to secure national competitiveness.



① | High Voltage Electron Microscope, HVEM

Atomic structure analysis of nanostructured materials

② | 15 T Fourier Transform Ion Cyclotron Resonance Mass Spectrometer, 15 T FT-ICR MS

Discovery of biomedicine, determination of crude oil price with components analysis

③ | High Field-Nuclear Magnetic Resonance, 900 MHz Cryogenic NMR

Structural analysis of body proteins and research of new medicines

④ | High Resolution-Secondary Ion Mass Spectrometer, HR-SIMS (SHRIMP)

Age dating of rocks creation, analysis of radioactive nuclides

⑤ | Multi Disciplinary in-situ Analytical System

In-situ analysis of nanomaterial properties and new materials

⑥ | Nano-Secondary Ion Mass Spectrometer, Nano-SIMS

Imaging analysis of trace elements in high-tech materials

⑦ | Femtosecond Multi-Dimensional Laser Spectroscopic System

Femtosecond level observation of dynamic structural change of molecules in real time

⑧ | Bio-High Voltage Electron Microscope, Bio-HVEM

Research on the three dimensional structure and dynamics of biomaterials at molecular level

⑨ | 7 T Human MRI System, 7 T Human MRI

Disease diagnosis, brain science research (brain tumor, Alzheimer, etc.)

Support for Research Equipment Industrial Ecosystem



Domestic research equipment performance evaluation and utilization lab

KBSI performs a role as a leading institute of promotion of research equipment industry through development of high-tech research instruments and core technologies, and through securement of instrument's reliability.

| Development of High-Tech Equipment

Remodeling and development of analysis equipment (complete products or key parts) and auxiliary systems through core technology development that meets the demands of cutting-edge research

- Cryogen-Free NMR System Using High-Temperature Superconducting Magnet

Development of a High-resolution Nuclear Magnetic Resonance (NMR) Spectrometer that elucidates the structure and motion of molecules by using the second-generation high-temperature superconducting magnet without the use of expensive liquid helium

- Low End Transmission Electron Microscope

Development of a Low End Transmission Electron Microscope (TEM) that allows novice users to easily analyzes the characteristics of functional nanomaterial properties and the structure of bio-specimen without staining process for the first time in Korea

- Ion Beam SIMS System

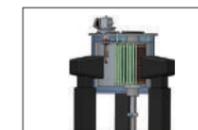
Development of gas cluster ion beam and liquid metal ion beam to construct a TOF-SIMS (Time-of-Flight Secondary Ion Mass Spectrometry) that allows for analysis of bio samples and surface of materials

| Education of Expert Technique for Equipment Maintenance

- Designing and performance of education program with expert technique on equipment maintenance based on the know-how of research equipment operation and management in KBSI
- Provision of training for the improvement of efficiency of research equipment such as maintenance of the best performance and life extension

| Evaluation of Performance of Domestic Research Equipment and Application Support

- Contributing to the promotion and support of domestic research equipment industry with the increased reliability of instruments through comparison/evaluation/diagnosis/improvement of domestic equipment by preparing the standard for the evaluation of domestic equipment performance and establishing/operating the domestic equipment application lab
- Supporting quality enhancement through the verification of superiority of research equipment and performance improvement through user-based tests on domestic analytic equipment



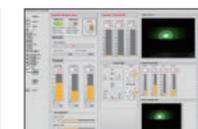
400 MHz NMR Magnet with 2nd-Generation Superconducting Tapes Wound and NMR Probe



External (left) and internal views of 2-Channel NMR Probe (right)



1st testbed for development of key elemental technologies & devices of low-end TEM



Testbed's operation platform & electron beam image acquired by optical CCD



Gas Cluster Ion Beam



Liquid Metal Ion Source



Education of expert techniques of equipment maintenance



Establishment of 'Domestic research equipment performance evaluation and utilization lab' to evaluate performance between domestic and foreign equipment (Open-lab system)

National Management of Research Facility and Equipment

National Research Facilities & Equipment Center

NFEC, National Research Facilities & Equipment Center

NFEC provides systematic support for promoting national science and technology by managing national research facilities and equipment. NFEC contributes to more effective investment of the research facilities and systems, expanding user facilities, providing educational and training programs in analytical science. We aim to build the advanced R&D infrastructure through the strategic investment and effective management system. <http://www.nfec.go.kr>



“Korea with powerful infrastructure of science and technology!

National Research Facilities & Equipment Center leads.”

| Strategic Investment

- 01 Execution of the Pre-Feasibility Studies on the facilities and equipment required for large-scale R&D programs
- 02 Preparation of a system to deliberate feasibility studies for construction of research facilities and equipment, and operation of a deliberation committee
- 03 Building a road map based on national demand prediction for the strategic construction of large-scale research facilities
- 04 Investigation and analysis on the investment and utilization of research facilities and equipment

| Promotion of Co-Utilization

- 05 Services to promote the co-utilization of research equipment and to provide various contents about research equipment
- 06 Call center service where we consult to the users about operation, utilization, recycling of research facilities and equipment
- 07 Browsing service of the information on the worldwide large-scale research facilities
- 08 Awarding to the honorable people contributed to the co-utilization of research facilities and equipment

| Overall Operational Management

- 09 Online service for the national management of the information on research facilities and equipment
- 10 Preparation of standard guidelines for lifecycle management of research facilities and equipment
- 11 Provision of education program on the ethical use of equipment, standard guidelines for the usage of equipment
- 12 Performance of a nation-wide investigation to check the implementation status of following the standard guidelines in the equipment operation
- 13 Promotion of the recycle of equipment by supporting the transfer the equipment from the old users to the new users
- 14 Operation of an electronic library that offers various reports on research facilities and equipment

Training of Analytical Science Researchers

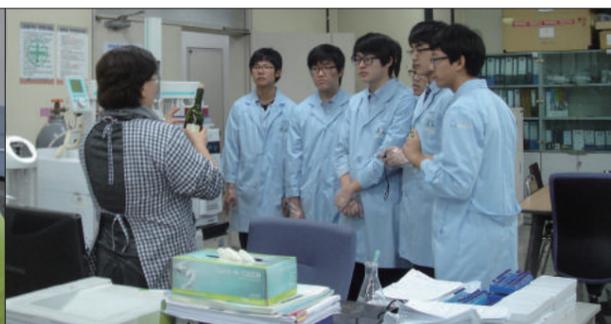


1. KBSI's Outreach Program

KBSI's education and outreach programs, "X-Science" and "Junior Doctor" strive to "inspire and motivate students to pursue careers in science and technology" and to "engage the public in sharing the experience of exploration and experiment" by utilizing R&D resources.



Junior Doctor



X-Science

2. Education Program for Research Equipment Engineer

As the only education program for research equipment engineer in Korea, we contribute to improving the utilization of research equipment and career development in scientific technology field by training research equipment experts who can operate and manage research equipment in basic scientific area, and analyze data through 1 year of the intensive education course focusing on field training. We selected professional education institutes in metropolitan areas around the country, and we annually and systematically perform the theoretical and practical education for core research equipment for customers(trainees) of each region.



Education Program for Research Equipment Engineer



Textbooks for the Programs

3. Graduate School of Analytical Science and Technology

Graduate School of Analytical Science and Technology (GRAST) was jointly established with Chungnam National University (CNU) as a new university-institute cooperation model to combine education and S&T research. Contributing to national S&T development and securing global research competitiveness, it aims to become the world's leading graduate school in the field of analytical S&T.



Lecture and Seminar



Research and Experiment

KBSI User Facilities

Area	Equipment	Area	Equipment
Daedeok Headquarters	Ultra Precision Freeform Generator		9.4 T Animal MRI System
	Micro X-Ray/UV Photoelectron Spectromicroscopy		4.7 T Animal MRI System
	Micro X-ray/UV Photoelectron Spectrometer		High Resolution Mass Spectrometer
	Expression Analysis System		High Resolution ESI Mass Spectrometer
	Carbohydrate Analysis System		Matrix-Assisted Laser Desorption Ionization-Mass Spectrometer Imaging System
	Amino Acid Composition Analysis System		15 T FT-ICR Mass Spectrometer System
	2-D Liquid Chromatography-Tandem Mass Spectrometer		7 T FT-ICR Mass Spectrometer
	MoFlosTM Astrios High-Speed Cell Sorter		Triple Quadrupole Mass Spectrometer System
	LC-MS/MS Spectrometer		Hybrid FT-ETD Mass Spectrometer
	SQUID-Vibrating Sample Magnetometer		High-Speed Q-TOF Mass Spectrometer
	Cryogenic Probe Station		Two-Dimensional Gas Chromatography/High Resolution Mass Spectrometer System
	16 T Physical Property Measurement System		Bio-High Voltage Electron Microscope
	Thermophysical Properties Measurement System		Bio-Transmission Electron Microscope
	Complex AFM-RAMAN Spectroscope		Glow Discharge Mass Spectrometer
	Helium Liquefier		Inductively Coupled Plasma System
	200 MHz Solid State Nuclear Magnetic Resonance spectrometer		Stable Isotope Ratio Mass Spectrometer
	Ultra High Voltage Transmission Electron Microscope		Environmental Radioactivity Measurement System
	Field Emission Transmission Electron Microscope		Thermal Ionization Mass Spectrometer
	Electron Probe Micro Analyzer		Multi-Collector Static Vacuum Mass Spectrometer System
	Ultra-Corrected-Energy-Filtered Transmission Electron Microscope		Automated OSL Spectrometer System
Ultra High Analytical Field Emission Scanning Electron Microscope	High Resolution-Secondary Ion Mass Spectrometer		
Focused Ion Beam	Laser Ablation-Multi Collector-Inductively Coupled Plasma Mass Spectrometer		
Multi Purpose X-Ray Diffractometer	Matrix-Assisted Laser Desorption Ionization Mass Spectrometer System		
Gas Adsorption-Desorption Measurement System	Elemental Analyzer		
500 MHz Solid State Nuclear Magnetic Resonance Spectrometer	Hybrid-FT Orbitrap Mass Spectrometer		
Ochang Headquarters	MicroPET/CT/SPECT	Seoul Center	X-Ray Diffractometer
	Multi-Angle Light Scattering		X-Ray Fluorescence Spectrometer
	Macromolecular X-Ray Diffractometer		Inductively Coupled Plasma Atomic Emission Spectrophotometer
	Macromolecular Automatic Crystallization System (Mosquito)		Biomolecule Analysis System (Amino Acid Composition Analyzer)
	Auto Isothermal Titration Calorimeter		Field Emission Scanning Electron Microscope
	Protein Synthesizer		Magnetic Property Measurement System
	CD Spectropolarimeter		Field Emission Transmission Electron Microscope
	400 MHz Nuclear Magnetic Resonance Spectrometer		Focused Ion Beam
	500 MHz Nuclear Magnetic Resonance Spectrometer		Ion Mobility Mass Spectrometer
	700 MHz Nuclear Magnetic Resonance Spectrometer		Femtosecond Multi-dimensional Laser Spectroscopic System
	800 MHz Nuclear Magnetic Resonance Spectrometer		Supercritical Fluid Chromatography System
	900 MHz Nuclear Magnetic Resonance Spectrometer		Analytical High Resolution Scanning Electron Microscope
	7 T Human MRI System		Super Resolution Confocal Microscope
3 T Human MRI System	UPLC-Q/TOF MS Spectrometer		

Area	Equipment	Area	Equipment	
Seoul Center	Biomolecule Mass Spectrometer System (TQ-LC/MS, MALDI-TOF/TOF-MS)		SPF Animal Facility of Aging Science	
	Atomic Absorption Spectrometer		Real-Time PCR	
Busan Center	Elemental Analyzer		Automatic Chemistry Analyzer	
	X-Ray Photoelectron Spectrometer System		Super Resolution Microscope System	
	Glow Discharge Spectrometer (GDS)		Dual Beam FIB System	
	Secondary Ion Mass Spectrometer		In Vivo X-ray Radiography Micro-CT System	
	Angle-Resolved X-Ray Photoelectron Spectrometer		High Impedance Temperature-Dependent Hall-Effect Measurement System	
	Multi-Purpose X-Ray Diffractometer		Analytical High Resolution Scanning Electron Microscope	
	Transmission Electron Microscope		Jeonju Center	High Resolution Scanning Electron Microscope
	UV-VIS Spectrophotometer			Field Emission Scanning Electron Microscope
	Energy Dispersive X-Ray Fluorescence Spectrometer			Particle and Pore Size Analysis System
	Gas Chromatography-Mass Analysis System			Atomic Force Microscope
	Inductively Coupled Plasma Atomic Emission Spectrophotometer			Matrix-Assisted Laser Desorption Ionization Mass Spectrometer
	Combustion Ion Chromatograph System			Electron Probe Micro Analyzer
	Nano Secondary Ion Mass Spectrometer			Micro Raman Spectrometer
Thermal Analysis System	Ultra High Resolution Scanning Electron Microscope			
Liquid Chromatography MS/MS Spectrometer System	Field Emission Transmission Electron Microscope			
Scanning Electron Microscope	Cs-Corrected STEM			
High-Vacuum FT-IR/Raman Imaging Spectrometer System	Photoluminescence Mapping System			
Time of Flight Secondary Ion Mass Spectrometer	Chuncheon Center			Energy Filtering Transmission Electron Microscope
Analytical High Resolution Scanning Electron Microscope		Laser Confocal Scanning Microscope System		
Daegu Center		X-Ray Diffractometer	Intravital Multi-Photon Confocal Laser Scanning Microscope	
	High Resolution X-Ray Diffractometer	Analytical High Resolution Scanning Electron Microscope		
	X-Ray Fluorescence Spectrometer	Field Emission Transmission Electron Microscope		
	Optical Spectrometer (UV/VIS/NIR Spectrophotometer)	Suncheon Center	Multi-Purpose X-Ray Diffractometer	
	High Resolution Mass Spectrometer		High Resolution Scanning Electron Microscope	
	Electron Microscope System		Field Emission Transmission Electron Microscope	
	Multi-Purpose X-Ray Diffractometer	Differential Scanning Calorimeter/Thermal Analyzer	Jeju Center	Organism Component Separation Analysis System
	High Resolution Scanning Electron Microscope	Analytical High Resolution Scanning Electron Microscope		
	Multi-Function X-ray Diffractometer	Inductively Coupled Plasma Mass Spectrometer		
	Field Emission Transmission Electron Microscope (200 kV)	Western Seoul Center	400 MHz Solid State Nuclear Magnetic Resonance Spectrometer	
	Time-Resolved Fluorescence Confocal Microscope		Single Crystal X-Ray Diffractometer System	
	FT-UV-VIS-IR Spectroscopic Imaging Microscope		500 MHz FT-Nuclear Magnetic Resonance Spectrometer	
	Wavelength Dispersive X-ray Fluorescence Spectrometer		600 MHz Solid State Nuclear Magnetic Resonance Spectrometer	
Gwangju Center	400 MHz Nuclear Magnetic Resonance Spectrometer	200 MHz Solid State Nuclear Magnetic Resonance Spectrometer		
	X-Ray Diffractometer	CW/Pulse EPR System		
	Luminescence and Fluorescence Animal Imaging System	Online LC-MS-NMR System		
	Laser Raman Spectrometer (Photoluminescence Analysis System)	500 MHz FT-NMR Spectrometer		
	Field Emission Scanning Electron Microscope	Gas Chromatograph/Mass Spectrometer		
	High Resolution Transmission Electron Microscope	Liquid chromatograph/Mass Spectrometer		
	Time-Resolving and Integrated PL/Raman Spectrometer	Pyrolysis-Gas Chromatograph/Mass Spectrometer System		
	Inductively Coupled Plasma Atomic Emission Spectrophotometer	700 MHz FT-NMR Spectrometer		
	500 MHz Nuclear Magnetic Resonance Spectrometer	SPE-800 MHz NMR-MS System		
	600 MHz Online LC-NMR-MS System	Multi Purpose X-Ray Diffractometer		
	Laser Confocal Scanning Microscope System	High Resolution Scanning Electron Microscope		
	Multi-Functional Transmission Electron Microscope			

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