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Tel.033.250.7275 Fax.033.255.7273

Western Seoul Center

Corporate Collaboration Center, 150, Bugahyeon-ro,
Seodaemun-gu, Seoul, Korea [03759]
Tel.02.6908.6211

KBSI KOREA BASIC
SCIENCE INSTITUTE

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Tel. 042-865-3500 FAX. 042-865-3404

www.kbsi.re.kr

NMR

KBSI

**WORLD-CLASS
BASIC RESEARCH
INFRASTRUCTURE
INSTITUTE**

**LEADING THE
INNOVATION
IN RESEARCH
FACILITIES AND
EQUIPMENT**

KBSI KOREA BASIC
SCIENCE INSTITUTE

KBSI VISION & GOALS

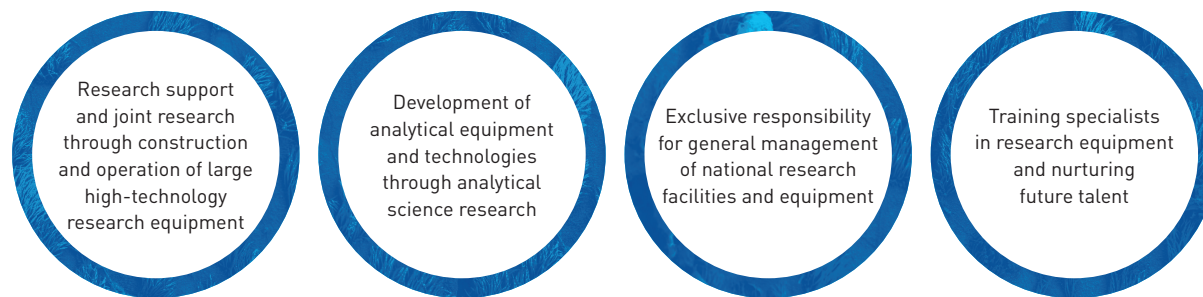
Mission

Conducting R&D on research facilities & equipment and analytical S&T, joint research, and supporting basic science promotion

Vision

World-class basic research infrastructure institute leading the innovation in research facilities and equipment

Main Functions



Action Plan

Enhancing creative and innovative research practices

Improving the quality of life by solving social problems

Providing a research environment with increased autonomy and scope for creativity

OVERALL MANAGEMENT OF NATIONAL RESEARCH FACILITIES AND EQUIPMENT

To improve national R&D output through supporting the management of research facilities and equipment, NFEC has been instrumental in policy making and systematically promoting investment efficiency and sharing of research equipment.



National Research Facilities & Equipment Center
nfec.go.kr



Strategic Investment

- The Preliminary Feasibility Studies (F/S)
- Deliberation System for National Research Facilities & Equipment
- The National Large Research Facilities Roadmap (NFRM)
- Management of Total Project Cost for National Research & Development



Promotion of Sharing of Research Equipment

- General education on national research facility management and ethics
- Operating a large research facilities information service
- Holding R&D Infrastructure Awards Ceremonies
- Facilitates the Transfer of Idle Facilities and Equipment to Other Researchers on Demand



Overall Operational Management

- Publication of standard guidelines for the management of national research facilities and equipment
- Provide legal opinions and revision review opinions on research facilities and equipment
- Establishment of National Research Facilities and Equipment Improvement Plan
- Conducting nationwide inspection of the operational management of national research facilities and equipment
- Conducting survey and analysis of national research facilities and equipment as well as performance management



Review, Evaluation and Deliberation concerning Facilities & Equipmen
red.zeus.go.kr



Zone for Equipment Utilization Service
zeus.go.kr



Facilities and Equipment Electronic Library
feel.nfec.go.kr

OPEN UTILIZATION
OF ADVANCED
RESEARCH
EQUIPMENT AND
RESEARCH
SUPPORT

KBSI seeks to implement customer value management (CVM) and quality management system with a set of state-of-the-art research equipment and quality workforce. Utilizing these resources, we will become a leading national institute for co-utilization of research equipment and research support.

KOREA
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INSTITUTE

OPERATION OF
LEADING-EDGE
EQUIPMENT

KBSI plans to establish a world-class platform for basic research with a set of leading-edge research equipment. The Institute will attract prominent domestic and foreign scientists to produce high-quality convergence research outcomes.

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Securement of competitiveness in analytical services

- Accumulating know-how in analytical management; developing analytical technologies; enhancing analytical performance and quality management system; and improving the operation system

Research support for joint research involving industrial, academic, and research institutes

- Establishing research infrastructure for open research convergence and cooperation

National research support network

- Establishing open research infrastructure for convergence and cooperation Nationwide research support network

KBSI NETWORK

/ Daedeok Headquarters /

- **Bioconvergence Analysis** Biological Disaster Research
- **Environmental & Material Sciences** Electron Microscopy Research, Advanced In situ Nanosurface Research
- **Scientific Instrumentation** Optical Instrumentation Development, Scientific Instrument Reliability Assessment, Instrumentation Development Support, Spin Engineering Physics Research, Mass Spectrometry and Advanced Instrumentation Research

/ Ochang Center /

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/ Seoul Center /

Environmental Risk Analysis and Research, Space-Time Resolved Molecular Imaging Research

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Advanced Aging Science Research

/ Western Seoul Center /

Omics System Research, Functional Interface Science

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/ Jeonju Center /

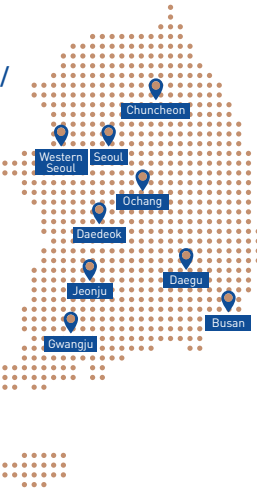
Nano & Carbon-based Materials Research

/ Daegu Center /

Functional Materials Research

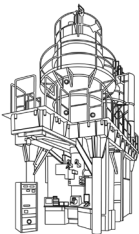
/ Chuncheon Center /

Disease-Specific Optical Imaging Research



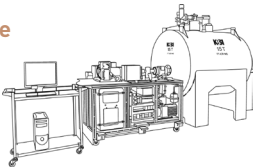
High-Voltage Electron
Microscope / HVEM

Atomic structure analysis of nanostructured materials



15 T Fourier Transform
Ion Cyclotron Resonance
Mass Spectrometer /
15 T FT-ICR MS

Fine aerosol- and polar soil-derived organic matter, crude oil, natural products and metabolite analysis



High-Field Nuclear
Magnetic Resonance
/ 900-MHz Cryogenic NMR

Protein structure analysis and drug development



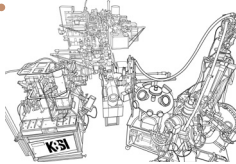
High-Resolution
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Age dating of rocks and analysis of radioactive nuclides



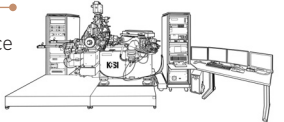
Advanced in Situ Nanosurface
Analysis System / AISAS

In situ analysis of nanomaterial properties and new materials



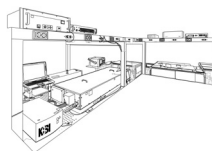
Nano Secondary Ion Mass
Spectrometer / Nano-SIMS

Imaging analysis of trace elements in high-tech materials



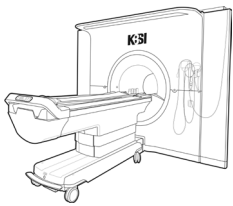
Femtosecond Multidi-
mensional Laser Spectro-
scopic System / FMLS

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



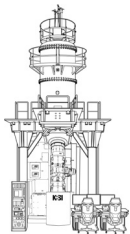
7 T Human
MRI System

Disease diagnosis and brain science research (brain tumor, Alzheimer's disease, etc.)



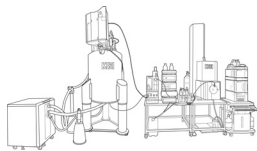
Bio High-Voltage Electron
Microscope / Bio-HVEM

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



SPE-800-MHz
NMR-MS System

Metabolite identification and metabolism elucidation in metabolomics / natural products / drug development research



FOSTERING THE DOMESTIC RESEARCH EQUIPMENT INDUSTRY

KBSI plays a leading role in fostering the domestic research equipment industry including assessing the performance of domestic research equipment, developing core technologies, and promoting joint research. It is essential to develop the quality of domestic research equipment. To this end, the Institute will strive to establish policies and a support system required for further development and commercialization of research equipment through joint efforts of the industrial, academic, and research sectors.

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SUPPORT FOR INDUSTRY

KBSI supports small and medium enterprises through “equipment utilization, joint research, human resources-knowledge, and technology transfer-commercialization” using technologies we have developed over the years.

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Operating a Scientific Instruments Reliability Assessment (SIRA) center and a application & demonstration laboratory for domestic research equipment

- Conducting reliability assessment and standardization to ensure the quality of domestic equipment; and performance improvement by ensuring the reliability, technological consultation, and support

Development of high-tech research instruments and core technologies

- Cryogen-free nuclear magnetic resonance (NMR) equipment with high temperature superconducting (HTS) magnet, Low-end transmission electron microscope (TEM), and TOF-SIMS with gas cluster ion beams (GCIB)
- Developing core technologies such as multimodal microscopic technology and STEM (Scanning Transmission Electron Microscopy)

Providing specialized technical education for equipment maintenance

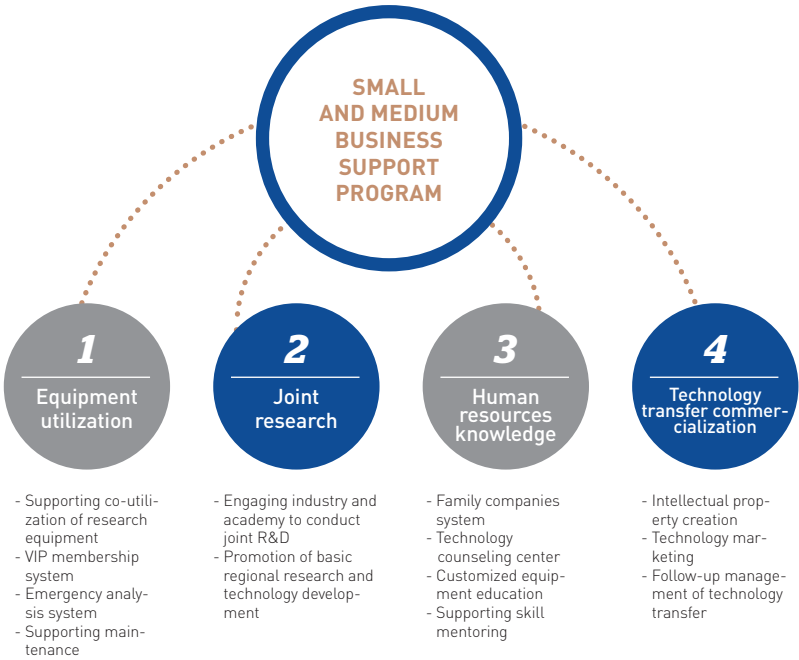
- Fostering quality workforce and creating jobs based on the know-how of research equipment management and maintenance

Cooperating with the Korea Analytical and Scientific Instruments Association (KASIA) to further enhance the competitiveness of the domestic research equipment industry

- Establishing policies and a support system that would include promoting the joint development of research equipment and commercialization between the KASIA, and the industrial, academic, and research sectors

Operating Smart Open Lab and an Ultra Precision Tech Shop (UPTS)

- Building an open laboratory and ultra-precision processing facilities to serve as a hub for industrial and academic cooperation



DEVELOPMENT OF ANALYTICAL TECHNOLOGIES

With its state-of-the-art research equipment infrastructure and analytical science technologies, KBSI restlessly continues to pioneer on new research frontiers through joint convergence research engaging the industrial, academic, and research professionals to develop fundamental technologies for the future, accessible technologies to resolve national and social problems, and convergence technologies.

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TRAINING OF ANALYTICAL SCIENCE RESEARCHERS

KBSI is training specialists in analytical science and equipment, and providing various opportunities to youth to engage in science.

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Integrated analysis technology to determine the geographical origins of various agricultural products

- Developing integrated analytical technologies and a standardization system for the discrimination of agricultural production countries

Development of high-sensitivity diagnostic platform for detection of infectious viruses

- Development of a highly sensitive diagnostic platform for on-site early detection of various diseases including infectious diseases

Analytical Technology in Disaster Science

- Researching analytical techniques for swift prevention and resolution of national-level environmental disasters and accidents

In vivo imaging assessment of theranostics

- Customized in vivo imaging assessment of anticancer drugs and cell therapeutics in animal models



KBSI's Popularization of Science

- Inspiring and motivating students to pursue careers in science and technology through outreach programs such as “X-Science” and “Junior Doctor”

R&D Equipment Engineer Education Program

- Conducting the first and only education program to nurture engineers to operate research equipment

KBSI Research Equipment Academy

- Conducting tailored educational programs for specialist and general operators

Graduate School of Analytical Science and Technology

- Jointly established Graduate School of Analytical Science and Technology (GRAST) with Chung Nam National University (CNU) to achieve global research competitiveness in Analytical Science & Technology

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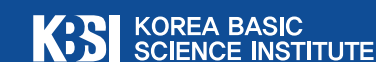
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WORLD-CLASS BASIC RESEARCH INFRASTRUCTURE INSTITUTE

LEADING THE INNOVATION IN RESEARCH FACILITIES AND EQUIPMENT

KBSI VISION & GOALS

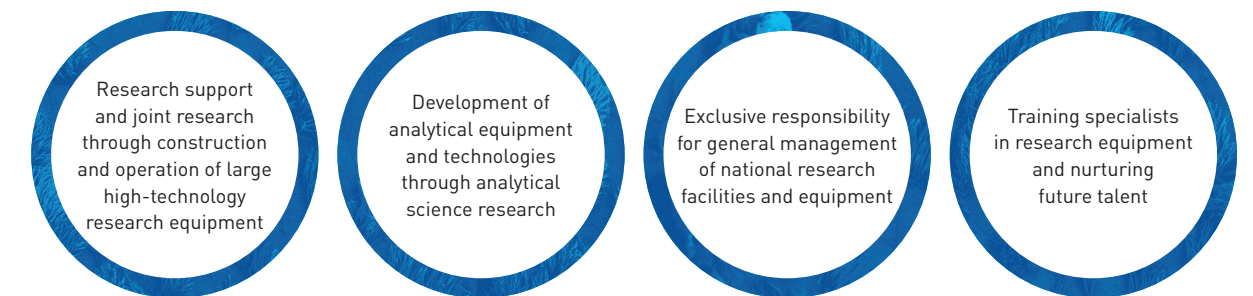
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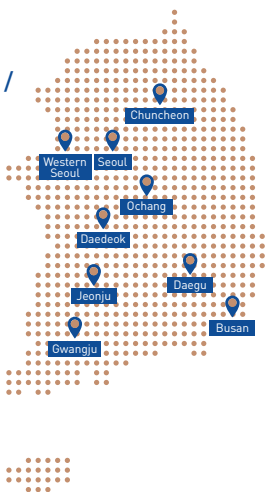
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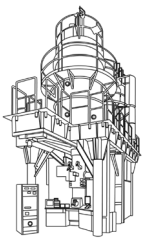
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Disease-Specific Optical Imaging Research



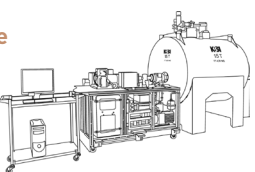
High-Voltage Electron
Microscope / HVEM

Atomic structure analysis of nanostructured materials



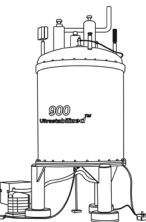
15 T Fourier Transform
Ion Cyclotron Resonance
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Fine aerosol- and polar soil-derived organic matter, crude oil, natural products and metabolite analysis



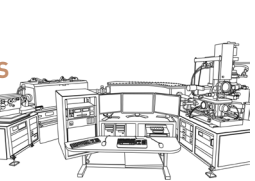
High-Field Nuclear
Magnetic Resonance
/ 900-MHz Cryogenic NMR

Protein structure analysis and drug development



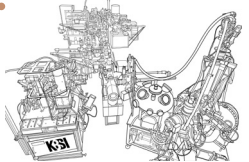
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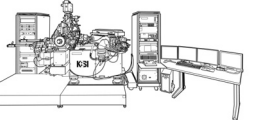
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In situ analysis of nanomaterial properties and new materials



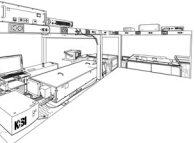
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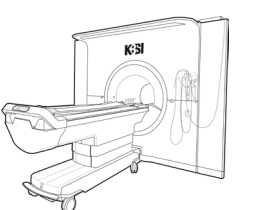
Femtosecond Multidi-
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Femtosecond level observation of dynamic structural change in molecules in real time



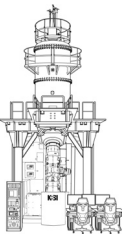
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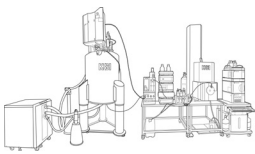
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Microscope / Bio-HVEM

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SPE-800-MHz
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- Developing integrated analytical technologies and a standardization system for the discrimination of agricultural production countries

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- Development of a highly sensitive diagnostic platform for on-site early detection of various diseases including infectious diseases

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- Researching analytical techniques for swift prevention and resolution of national-level environmental disasters and accidents

In vivo imaging assessment of theranostics

- Customized in vivo imaging assessment of anticancer drugs and cell therapeutics in animal models

TRAINING OF
ANALYTICAL
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RESEARCHERS

KBSI is training specialists in analytical science and equipment, and providing various opportunities to youth to engage in science.

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KBSI's Popularization of Science

- Inspiring and motivating students to pursue careers in science and technology through outreach programs such as “X-Science” and “Junior Doctor”

R&D Equipment Engineer Education Program

- Conducting the first and only education program to nurture engineers to operate research equipment

KBSI Research Equipment Academy

- Conducting tailored educational programs for specialist and general operators

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- Jointly established Graduate School of Analytical Science and Technology (GRAST) with Chung Nam National University (CNU) to achieve global research competitiveness in Analytical Science & Technology