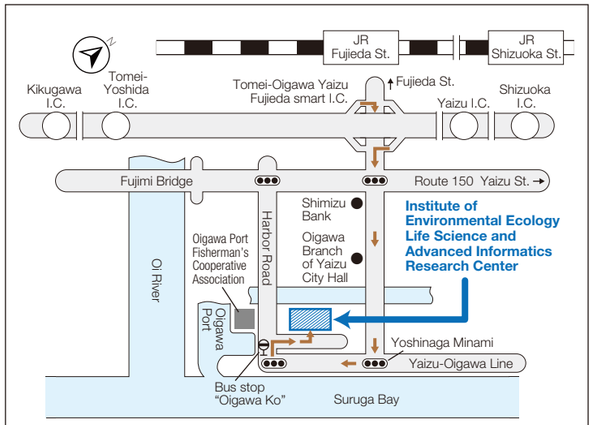
IDEA Consultants, Inc.

Institute of Environmental Ecology / Life Science and Advanced Informatics Research Center

For Our Bright Future



1334-5 Riemon, Yaizu-shi, Shizuoka 421-0212
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Access

●By train

Tokaido-Sanyo Shinkansen Shizuoka St. → Tokaido Line Fujieda St. → 20minutes by taxi or
Tokaido Line Yaizu St. → By bus to Oigawa Port → 2-minute walk

Registration / Accreditation / Certification

- Measurement certification business operators
  Measurement certifications of concentration for chemical substances in air, water or soil (registration: Shizuoka Pref.)
  Measurement certification for concentration of dioxins in air, water or soils (registration: Shizuoka Pref.) (MLAP)
- ISO/IEC 17025 accreditation (analysis of dioxins: Cd, Pb, Hg, Se, and Mn in Whole blood, Hg in biological, air or fish)
- ISO/IEC 27001 accreditation (Information Security Management System)
- ISO/IEC 17043 accreditation (conformity assessment - general requirements for proficiency testing)
- Working environment measurement agency (registration: Shizuoka Labor Bureau)
- Sanitation inspection facility
  Biochemical inspection, pathogen nucleic acid inspection (registration: Shizuoka Pref.)
- Chemical substances GLP (certified by Ministry of the Environment)
- HACCP accreditation (registration: Shizuoka Pref.)

(as of July 1st, 2025)

IDEA Website

For more details of IDEA's services, technologies and corporate information, please go to our website.
URL : https://ideacon.jp/

Official YouTube channel

IDEA's corporate profile video with a showcase of its technologies.

This brochure is printed on FSC™-certified paper and produced using an environmentally friendly printing process that employs VOC-free ink and waste-liquid-free printing plates.
The greenhouse gas emissions generated during production and printing-396.2kg CO_2-e-have been offset, thereby supporting domestic CO_2 reduction initiatives.

202604-01-01

Message from the Board

The Institute of Environmental Ecology was established in May 1992 in Oigawa Town, Shizuoka Prefecture (now Yaizu City), to serve as our central hub for technological development in biological and chemical research. Since then, the institute has contributed to solving evolving environmental and societal challenges through a wide range of initiatives: biological and chemical analyses essential for understanding the environment, development of technologies for ecological restoration and species cultivation using seawater and groundwater, ecotoxicity tests, and environmental risk analysis and evaluation.

One of our distinguishing features is our early focus on gene analysis technologies and their application to environmental research. In June 2023, we launched Life Science and Advanced Informatics Research Center to further advance genetic analysis and serve as a core for life sciences innovation. This center is dedicated to enhancing environmental DNA analysis, exploring emerging techniques such as microRNA analysis, and evaluating the risks of chemical substances that may affect human health. Through these efforts, we aim to create new value through new businesses.

Today, environmental issues are becoming increasingly severe: frequent and intense natural disasters caused by climate change, loss of biodiversity, marine pollution from plastic waste, and the emergence of new hazardous substances affecting both ecosystems and human health. To ensure the sustainable development of a safe, secure, and well-functioning society and to protect and pass down a healthy and bountiful natural environment, these growing environmental challenges must be addressed.

Since our establishment, we have valued “a spirit of foresight and pioneering”. By combining our advanced facilities and specialized expertise, and with our cutting-edge robotics and AI technologies, we are committed to creating new value through innovation. We will continue to tackle environmental problems and social issues for the future of both people and the planet.

We sincerely appreciate your continued support, guidance, and partnership.

Chairman Hideo TABATA
President Akihisa TABATA

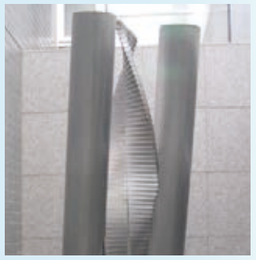
— Our Journey in Genetic Analysis Reflected in Monuments —

Inspired by the long evolutionary journey of life, these monuments–“Kizuna” and “Gensoku”– embody the inheritance of genes and the mechanisms by which they are expressed. They also reflect the connections between people, between individuals and society, and the values that guide our work. Through the spirit embedded in these monuments, we reaffirm our commitment to building a sustainable society and passing on a rich and vibrant environment to future generations.

2000

“絆 (*Kizuna*-Ties)”

(Headquarter 1F Entrance Hall)



This sculpture, modeled after the double helix structure of DNA, was installed at our headquarter in Setagaya, Tokyo, in the year 2000. It reflects our awareness of the growing role of genetic technologies in the 21st century and symbolizes a shift from an era focused on material abundance to one that values human connection: between individuals and society.

2023

“原則 (*Gensoku*-Principle)—microRNA”

(Life Science and Advanced Informatics Research Center)

“原則 (*Gensoku*-Principle)—The Genetic Code”

(Life Science and Advanced Informatics Research Center, 6F Foyer)

This was created using motifs of microRNA and the genetic code (codons)—key elements in the regulation of gene expression and protein synthesis, which are fundamental to all life processes. It serves as a symbolic representation of the advanced genetic research being conducted at the Life Science and Advanced Informatics Research Center.

Milestones

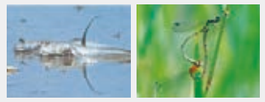
1969 METOCEAN | 2001 METOCEAN | 2006 IDEA

1970-

1972

- The First Technical Research Institute, which later evolved into the Institute of Environmental Ecology, was established in Meguro, Tokyo

- Installation of dioxin analysis instruments



- Captive breeding of endangered species

1992

- Institute of Environmental Ecology was built in Oigawa, Shizuoka (now Yaizu)

1995

- Institute of Environmental Informatics established in Yokoyama, Kanagawa

1999

- Installation of DNA sequencer
- Started species identification by DNA analysis

2000-

2000

- Certified as GLP testing facility for aquatic veterinary drugs
- Development of fish test methods for endocrine-disrupting chemicals

2001

- Registered as public health testing laboratory

2003

- Certified as GLP-compliant testing facility under the Chemical Substances Control Law (CSCL)
- Registered to conduct designated measurement certification services

2005

- Launched mercury and methylmercury analysis in biological samples
- Research and development of seagrass bed restoration

2007

- Development of amphibian test methods for endocrine-disrupting chemicals

2009

- Research and development of restoration technologies to rehabilitate lakeshore plants and vegetation

2010-

2010

- Established the Research Institute on Subtropical Ecosystems in Nago City, Okinawa

2011

- Initiated radiation monitoring activities
- Began collaboration with the Japan Environment and Children’s Study (JECS)
- Launched Whole Effluent Toxicity (WET) tests

2013

- Opened the Food and Life-Science Laboratory at the Osaka Branch Office

2014

- Obtained ISO/IEC17025 (dioxin analysis) accreditation

2016

- Initiated beekeeping activities
- Started microplastics analysis
- Obtained ISO/IEC17025 (heavy metals) accreditation

2017

- Pioneered eDNA-based methods to monitor biodiversity

2018

- Initiated offshore environmental survey projects on marine mineral resource development

2020-

2020

- Launched deep-sea ecological monitoring using a hovering-type AUV

- Launched COVID-19 testing services

2021

- Patent granted for an ultra-early cancer detection method using microRNA methylation

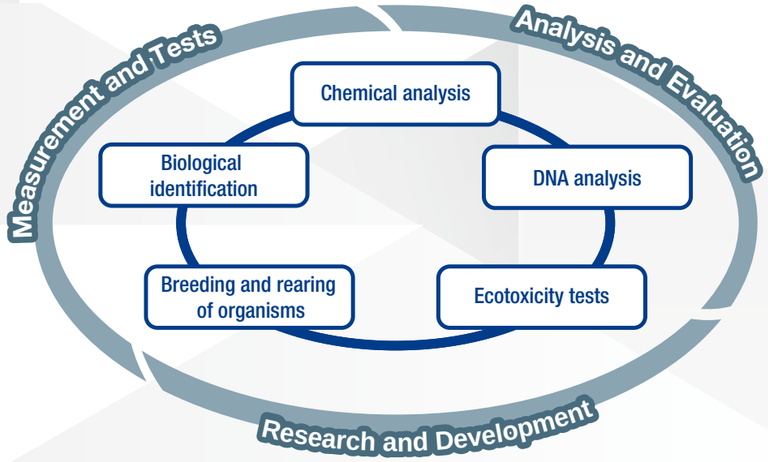
2023

- Establishment of Life Science and Advanced Informatics Research Center
- Obtained ISO/IEC17043 accreditation

2025

- Obtained ISO/IEC27001 accreditation

Collaborative Synergy of Key Technologies is Driving Our Mission



Our Work at a Glance

Research on Environmental Chemicals

Contributing to a Sustainable Society

Chemicals enrich our lives but can also harm the environment. We work to understand their impact, ensure the safe use of resources, and advance solutions for a low-carbon, circular economy. Through chemical analysis and model experiments, we contribute to a cleaner, more sustainable future.

Preservation of Biodiversity

Supporting the Conservation, Restoration, and Creation of Natural Environment

Biodiversity is vital to our lives, providing essential benefits such as safe water and food. Yet climate change, habitat loss, and invasive species pose serious threats to local wildlife and ecosystems. Using expertise in species identification, breeding, and cultivation, we work to conserve, restore, and create rich ecosystems where diverse life can thrive.

Environmental Risk Management

Helping Build a Safe and Secure Society in Harmony with Nature

Environmental pollution can pose serious risks to human health and ecosystems. It is essential to scientifically assess these risks and take action to avoid or reduce them. Through ecological impact testing and advanced data analysis, we quantitatively evaluate environmental risks and work to mitigate them, contributing to a safe, secure, and nature-rich society for future generations.

Providing Genetic Analysis Solutions

Supporting Social Progress and Enriching Lives

Genetic analysis offers vast potential to improve our environment and health. From assessing ecosystems and biodiversity to discovering new genetic resources and enabling early disease detection, its applications are wide-ranging. Through innovation in genetic technologies, we create new value, address diverse environmental and health challenges, and help foster a thriving society and better quality of life.

Human Chemical Exposure Assessment

Supporting Health and Well-Being

Many chemicals are known to be harmful to human health, making it essential to accurately measure exposure levels. Exposure during pregnancy may affect the growth and development of unborn children. Using advanced analytical technologies, we assess chemical exposure in the human body and evaluate its risks, helping prevent disease and protect health and well-being.

Research on Environmental Chemicals

Chemical analysis of environmental samples

Chemical analysis in the environment

We analyze a wide range of samples, including environmental samples (water, sediment, soil, air, wildlife), food, indoor dust, and products, for organic chemicals (POPs, PFAS, etc.), and heavy metals using advanced instruments. We also provide continuous monitoring to track environmental changes over time.

- **Dioxins (ISO/IEC 17025 accreditation), POPs**
- **PFAS**
- **Pesticides, endocrine disrupting chemical**
- **Pharmaceutical products, chemicals in daily use**
- **Heavy metals, speciation of metals**


Double-focusing mass spectrometer (GC-DFMS)


Liquid chromatography-tandem mass spectrometry (LC-MS/MS)


Inductively coupled plasma mass spectrometry (ICP-MS)


Speciated mercury sampling in the atmosphere

Method development for emerging pollutants

We develop analytical methods for new pollutants using the latest analytical instruments to respond to emerging needs. For example, we can simultaneously analyze over 40 PFAS compounds, which are of global concern, with high sensitivity.

Regarding microplastics (MP), whose impact on the marine environment are of concern, we analyze fine MP smaller than 100μm using FT-IR (Fourier Transform Infrared Spectroscopy) microscopy.

In addition, we provide support for the development and planning of analytical and evaluation methods using advanced equipment, including the detection and identification of unknown compounds (new pollutants) in environmental samples through comprehensive analysis using gas chromatography–time-of-flight mass spectrometry (GC-TOF/MS).


Analysis of MP by FT-IR microscopy


Comprehensive analysis using GC-TOF/MS

Support for improving monitoring technology

We support the development of environmental monitoring technical capacity and systems in developing countries through projects with governments and international organizations, addressing global environmental issues such as mercury pollution.

We also contribute to enhancing the international reliability of analytical data obtained from environmental monitoring by providing reliable proficiency testing in accordance with ISO/IEC 17043. Our institute obtained ISO/IEC 17043 accreditation in 2023, covering Cd, Pb, Cu, and Zn in wastewater, environmental water, tap water, and drinking water. We also provide reference materials related to proficiency testing.


Technical training for developing countries


Education and training for analysis of mercury


Participation in international awareness-raising activities related to the Minamata Convention


Sample preparation for proficiency tests

Scientific experiments

Experiments related to material circulation in water bodies

We conduct experiments to measure material cycle–related parameters essential for eutrophication assessment under controlled water temperature and light conditions using thermostatic baths. In addition to physicochemical analyses of sediment samples (e.g. grain size distribution and loss on ignition), sediment age dating using the Pb-210/Cs-137 method is performed to support data interpretation.

- **Main research and experimental topics include:**
  - **Nutrient leaching, sediment oxygen consumption, and denitrification**
  - **Organic matter decomposition in water columns**
  - **Pesticides, endocrine disrupting chemicals**
- **Sediment age dating (Pb-210/Cs-137 method)**
- **Analysis and elusion experiments of toxic substances in sediment and sludge**


Constant temperature rooms


Nutrient elution experiment


Denitrification experiment


Germanium semiconductor gamma-ray detectors

Research on decarbonation and resource recycling

We evaluate the biodegradability of chemicals and plastics and measure CO_2 generation from organic matter decomposition in dredged sediments using standardized methods. We also support decarbonization and resource circulation research through biodegradability assessments, CO_2 fixation experiments, and environmental impact and safety evaluations for the reuse of sediments and activated sludge.

- **Biodegradability testing (chemicals, plastics, etc.)**
- **Soil respiration test**
- **Plastic disintegration test using seawater**
- **CO_2 fixation experiment**


Biodegradability in chemicals (TG306)


Soil respiration test


Experimental tank with natural seawater flowing over it

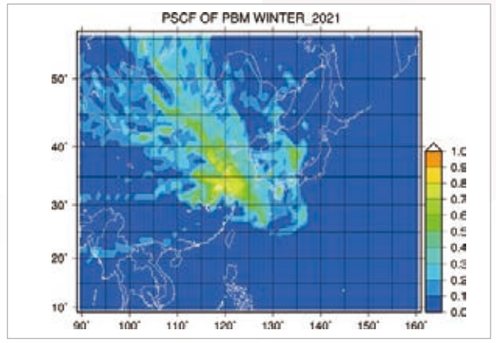

CO_2 absorption test in air and water using steel slag utilization material

Analysis and Evaluation

Environmental dynamic analysis

We conduct analyses such as source estimation, environmental distribution, and intermedia transport to understand the environmental fate of chemicals for risk assessment.

- **Hazardous air pollutant source estimation (Backward Trajectory)**
- **Source contribution analysis of toxic substances (Chemical Mass Balance method)**
- **Community characterization by isomer distribution pattern**
- **Environmental concentration prediction of ship anti-fouling paints-derived chemicals (MAMPEC)**



Estimating sources of atmospheric mercury speciation

Preservation of Biodiversity

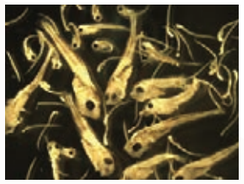
Biological analysis

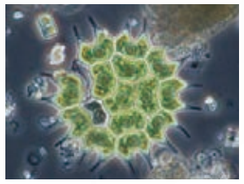
Morphological species identification and determination of aquatic organisms

Accurate understanding of organism abundance and biodiversity is essential for environmental impact assessment and ecosystem restoration. Our experts identify diverse species from freshwater to marine environments using morphological and experimental identification methods, including fish egg rearing.

- **Phytoplankton and zooplankton**
- **Benthos, sessile organisms**
- **Seaweed, seagrass, aquatic plants**
- **Fish and shellfish (fish, crustacean, cephalopods, etc.), fish eggs, larva and juvenile**


Biological analysis by specialists


Larva and juvenile

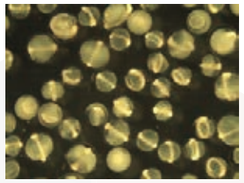

Phytoplankton


Organisms in tideland

Species identification and survey of genetic diversity by DNA analysis

Species identification is conducted using DNA sequence analysis on a wide range of samples, including fish eggs and larvae, tissue fragments (e.g. hair, wings, blood), and excrement. We also perform individual and population analyses to assess genetic diversity.
In addition, environmental DNA (eDNA) analysis is used for biota surveys and for detecting rare and invasive species.

- **Species identification from biological samples**
- **Individual identification, parentage and genetic diversity analysis**
- **Feeding habits analysis using excrement and stomach contents**


Identification of fish eggs


Individual identification by excrement (Amami rabbit)

Biological experiments

Rearing and reproduction experiments of aquatic organisms

We conduct a wide range of rearing and reproduction experiments using aquatic organisms from freshwater to marine environments. These include studies on conservation-oriented preservation and breeding methods, control of invasive species, and evaluation of dietary effects on cultivated species through growth comparison and gonadosomatic index analysis.

- **Examination of rearing and reproduction (rare species, cultivated species, etc.)**
- **Examination of control method of alien species**
- **Temporary rearing for biological transplantation**
- **Effect/safety verification of feed for aquaculture**


Reproduction of rare species
(Left: *Mortonagrion hirosei* Right: *Gasterosteus aculeatus*)


Water filtration rate examination of clams

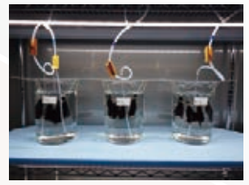

Constant temperature room

Preservation and restoration support of blue carbon ecosystem

We support the conservation and restoration of blue carbon ecosystems, including seaweed and seagrass communities and tidal flats, through laboratory experiments and on-site biological surveys.
Our facilities enable seed production, cultivation, and transplantation experiments for seaweed and seagrass using natural seawater. We also collaborate with the Research Institute on Subtropical Ecosystems (RISE) in Okinawa to support blue carbon ecosystem restoration in temperate regions.
In addition, we conduct safety evaluations of products using various aquatic organisms and perform biological experiments to obtain parameters required for ecosystem model–based functional assessments.


Seed production of seaweeds


Seaweed/seagrass community made by IDEA


Safety evaluation experiment of slag (impact assessment test on Nori seaweed buds in leaching solution)

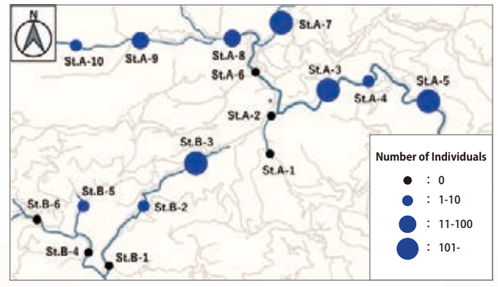

Habitat status survey of organisms in tideland

Analysis and Evaluation

Diversity evaluation of aquatic ecosystem

Ecosystem diversity is a key factor in evaluating the impacts of development, climate change, and ecosystem restoration in aquatic environments. We analyze and assess biodiversity based on site characteristics and project objectives.
In addition to fisheries impact assessments, we conduct multi-perspective evaluations focusing on nature-positive outcomes, such as habitat creation and enhancement of ecosystem services in coastal developments, including offshore wind farms. We also apply environmental DNA analysis for aquatic biodiversity surveys.

- **Biodiversity evaluations**
- **Assessment using indicator species (Average Score Per Taxon, EPT)**
- **Relationships between fauna and environmental factors (Canonical Correspondence Analysis, Two-way Indicator Species Analysis)**
- **Species distribution and habitat potential mapping (important, rare and invasive species)**



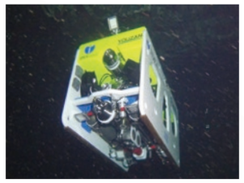
Distribution map

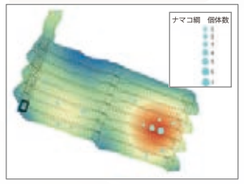
Deep-sea ecosystem evaluation for development of marine resources

Comprehensive environmental and ecosystem surveys are essential for reducing impacts and ensuring the sustainable use of deep-sea resources during marine mineral development. Our experts conduct biota surveys using video footage and samples collected by remotely operated vehicles (ROVs).
We also use a hovering-type AUV, YOUZAN, to continuously observe seabed and biological changes, enabling visualization of deep-sea ecosystems such as habitat mapping. These ROV and AUV techniques are also applicable to ecosystem assessments in coastal and bay areas.


Deep-sea organisms
(*Chimaeriformes* sp.)


Biota survey using remotely operated vehicle


Autonomous underwater vehicle "YOUZAN"



Visualization of deep-sea ecosystem (habitat map)

Providing Genetic Analysis Solutions

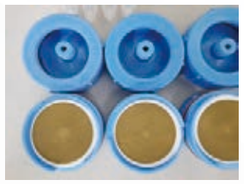
Environmental DNA analysis

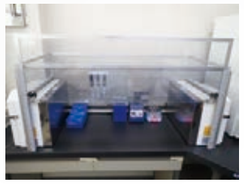
Comprehending ecosystems and biodiversity

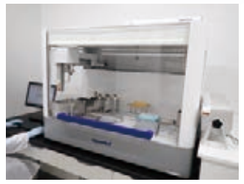
We estimate species composition by analyzing environmental DNA (eDNA) and propose optimal methods tailored to survey objectives, such as detecting rare or invasive species and assessing their distribution.
Our rapid, cost-effective, and high-precision analyses use state-of-the-art facilities, including an open clean air system and automated liquid handling to minimize contamination and streamline sample preparation.

- eDNA analysis for specific species (species-specific analysis)
- Primer design for species-specific analysis
- eDNA analysis for taxa (comprehensive analysis)


Collection of eDNA analysis samples


Filtration of environmental DNA samples

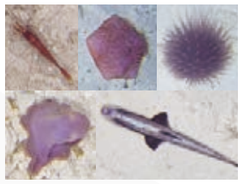

Open Clean Air System


Automated Liquid Handler

Genetic resources conservation and use

We support the sustainable use of biological resources through the conservation of genetic diversity and the exploration of valuable genetic resources. In deep-sea environments, we apply eDNA analysis to seawater collected by AUVs and water samplers to explore genetic resources from deep-sea organisms, including microorganisms.

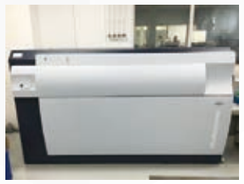
Collection of eDNA samples using AUV

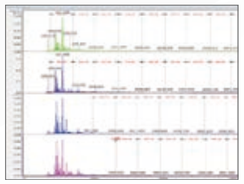

Various deep-sea animals captured by AUV imaging

Health risk assessment

Early cancer risk screening by microRNA

Mutated microRNA (miRNA) released from cancer cells into the blood serve as biomarkers for cancer. Our analytical technology, developed in collaboration with Osaka University, utilizes mass spectrometry (MALDI-TOF/TOF-MS) and is effectively applied in “Early Cancer Risk Screening” even for intractable gastrointestinal cancers in their initial stages.


Time-of-flight tandem mass spectrometer (MALDI-TOF/TOF-MS)


Detecting microRNA methylation

Microbiome and pathogen assays

Changes in the human microbiome are associated with disease risk. We perform high-precision, comprehensive analyses of gut, skin, and oral microbiota using next-generation sequencing.
We also handle samples containing potentially harmful microorganisms or viruses in our Biosafety Level 2 laboratory.

- COVID-19
- Dioxins (blood, breast milk)
- Lead, cadmium (blood)
- Total mercury, methylmercury (blood, urine, umbilical cord, hair)


Next Generation Sequencer


Intestinal microflora analysis (DNA extraction)

Human Chemical Exposure Assessment

Chemical analysis (human biological sample)

Chemical analysis of biological samples

We analyze organic chemicals, heavy metals, and their metabolites that may affect human health, and evaluate their effects using state-of-the-art, high-sensitivity instruments capable of handling small biological samples. Our metal analysis in biological samples is accredited under ISO/IEC 17025.

- POPs, PFAS
- Agrochemicals
- Household chemicals (plasticizers, cosmetics, disinfectants, fragrances)
- Heavy metals (ISO/IEC 17025: Cd, Pb, Hg, Se, Mn in blood)
- Mercury (ISO/IEC 17025), methylmercury


Gas chromatograph-tandem mass spectrometer (GC-MS/MS)


High performance liquid chromatography-tandem mass spectrometry (LC-MS/MS)

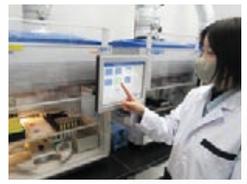

Inductively coupled plasma-tandem mass spectrometry (ICP-MS/MS)

Cold vapor atomic absorption spectrometry

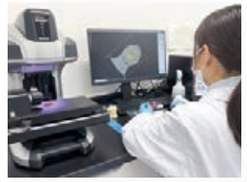
Chemical health effect studies

We conduct large-scale nationwide epidemiological studies and human biomonitoring to assess the effects of environmental chemicals on children’s growth and development and to evaluate human exposure levels.
Our facilities are equipped with numerous ultra-low temperature freezers for long-term sample storage, as well as automated sample preparation systems that minimize human error and enable rapid analysis of thousands to tens of thousands of samples.
Under an ISO/IEC 27001–compliant information management system, we provide comprehensive support for large-scale surveys, including the preparation and distribution of sample collection kits, AI-assisted questionnaire surveys, and high-precision 3D measurement of solid biological samples.


Ultra-low temperature freezer for biomedical sample storage


Automated sample preparation workstations


Preparation of sampling kits


Measurement of deciduous tooth dimensions and volume

Analysis and Evaluation

Analyzing and assessing environmental impact on human health

We study the relationship between health, environment, and lifestyle to identify factors contributing to health deterioration and disease prevention.
Using high-resolution LC-MS (Orbitrap), we analyze unknown compounds in human samples. We also examine environmental–health relationships through genetic analysis and health risk data collection to support risk assessment and disease prevention.


Orbitrap mass spectrometer


Elucidation of the causal relationship between environmental factors and health

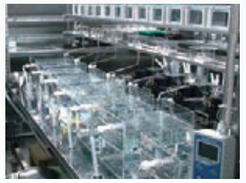
Environmental Risk Management

Analysis and Testing

Ecotoxicity testing

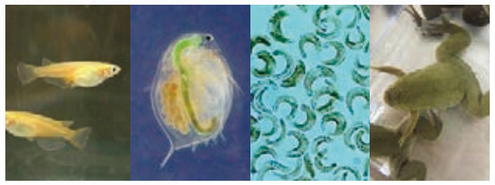
We conduct ecotoxicity tests on fish, crustaceans, algae, and other aquatic organisms in accordance with Japanese CSCL and OECD Test Guidelines. Our services include endocrine-disruption tests and marine and benthic organism assays, all performed in compliance with Good Laboratory Practice (GLP) standards.

- **CSCL tests: Acute toxicity (fish, daphnia), Daphnia reproduction, algal growth inhibition tests**
- **Endocrine disruption tests: Fish short-term reproduction, amphibian metamorphosis assays**
- **Marine organisms: Acute toxicity and phytoplankton growth inhibition tests**
- **Benthic organisms: Sediment toxicity tests (freshwater amphipods)**



Fish toxicity test apparatus (flow-through system)

Algae test apparatus (continuous culture)



Model organisms (from left: *Oryzias latipes*, *Daphnia magna*, *Raphidocelis subcapitata*, *Xenopus laevis*)

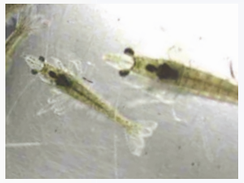
Ecotoxicity testing of effluents and materials used in the environment

We evaluate the effects of wastewater and environmental materials on aquatic organisms using both freshwater and marine species. We also support chemical analysis of wastewater and leaching tests of materials.

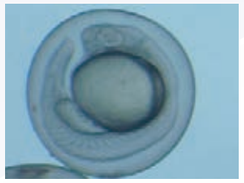
- **Whole Effluent Toxicity (WET) Tests: Fish embryo toxicity, *Ceriodaphnia dubia* reproduction, algal growth inhibition tests**
- **Industrial effluents: Fish embryo toxicity tests (e.g. for bluesign® certification)**
- **Recycled materials: Safety tests using commercially important aquatic species (fish, crustaceans, seaweed)**

Sampling of effluent (WET test)

Ceriodaphnia dubia reproduction test (WET test)



Marine model organism (*Marsupenaeus japonicus*, Kuruma shrimp)



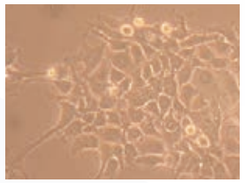
Zebrafish (*Danio rerio*) fertilized eggs

Supporting alternative methods to animal testing (in vitro assays)

We provide alternative testing methods that reduce animal use, including in vitro assays and tests using cells of pre-feeding stage organisms in accordance with OECD test guidelines.
These embryonic fish and amphibian tests can also include target gene expression analysis after chemical exposure.

- **In vitro assays: Reporter gene assays (RGAs) using animal cells transfected with hormone receptor genes.**
- **Fish embryo acute toxicity test (OECD TG236)**
- **Xenopus eleutheroembryonic thyroid assay (OECD TG248)**

In vitro reporter gene assay (Gene transfection into cultured cells)



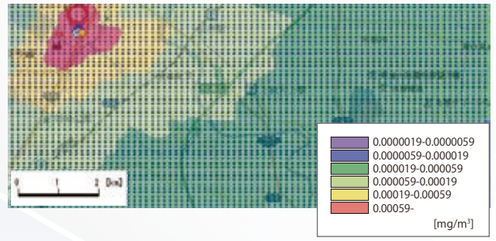
In vitro cultured cells (HEK293 cell line)

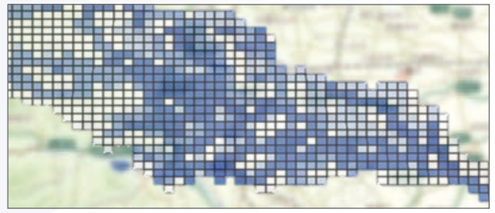
Analysis and Evaluation

Analysis and evaluation of ecological risks of chemicals

We support ecological risk assessment by integrating chemical exposure levels and toxic effects on ecosystems and wildlife.
Exposure assessments use public monitoring data and predictive models applied under Japan's Chemical Substances Control Law (CSCL), while hazard assessments are based on reliable domestic and international data sources. When necessary, we conduct ecotoxicological tests to supplement insufficient toxicity data.

- **Ecological risk assessment: Support for CSCL and agrochemical-related assessments**
- **Test targets: Effluents and recycled materials containing hazardous chemicals**
- **Hazard data analysis: CSCL compliance, GHS classification, product safety**
- **Exposure analysis: PRTR emission estimation, modeling, and source analysis**





Estimation of environmental concentrations of hazardous chemicals using mathematical models:
- Top: Estimated atmospheric concentration distribution by METI-LIS [1].
- Bottom: Estimated river water quality concentration distribution by AIST-SHANEL [2].

1) METI-LIS: Low-level industrial source dispersion model.
2) AIST-SHANEL: Simulation by hydrological and nutrient transport model for environmental load.

Analysis of human exposure and health risks of chemicals

Exposure levels (internal doses) of chemicals that may adversely affect human health are evaluated using biomonitoring data, together with estimation of exposure routes and sources based on comparisons with chemical levels in food and environmental samples.
We also compile information from domestic and international studies and mammalian toxicity values to support comprehensive human health risk assessments.

- **Analysis of environmental epidemiology data**
- **Collection of information related to human health risks**

Blood sampling for chemical analysis in blood (performed by physicians or nurses)

Analysis of chemical data from biological samples

Environmental risk mitigation and consulting

We provide support for the mitigation of environmental risks caused by hazardous chemicals, including both ecological and human health risks. Services include scientific evaluation of mitigation measures based on analytical and experimental data, development of assessment methods, and collection of regulatory information from around the world.
Scientifically grounded and neutral risk communication among key stakeholders, including businesses, consumers, and regulatory authorities, is also supported.

Meetings with overseas regulatory agencies regarding the development of new testing methods

Briefing sessions for study participants in environmental epidemiological surveys

Manufacturing and Sales

Functional Research, Manufacturing, and Sales of Honey

Beehives (Yamanashi Prefecture)

Our group maintains beehives in Yamanashi Prefecture for research purposes and produces honey as a by-product of these activities.

Only fully ripened honey is harvested, resulting in a rare, natural product without moisture adjustment by heating. Each batch undergoes DNA analysis to identify nectar source plants, as well as component analysis to assess health-related properties. To ensure product safety, we have obtained the Shizuoka Prefecture Mini HACCP certification—the first granted for honey products.

Marketed as “Honey Seriously Produced by an Environmental Company,” our honey is available through our direct sales website and as a return gift under the Furusato Nozei (hometown tax donation) program in Yamanakako and Oshino Villages.

※ The manufacturing process is carried out by Life Care Services Co. Ltd.

Manufacturing and Distribution of Reference Materials

Reference materials are essential standards in chemical metrology, supporting accurate measurement, instrument calibration, and method development and validation.

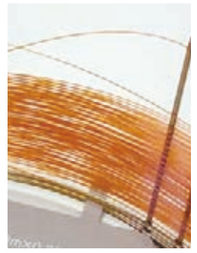
These materials are manufactured by our company and developed and distributed in collaboration with the Japan Society for Analytical Chemistry.

【Available reference materials (Examples)】

- **Standard materials for radioactivity analysis**
- **RoHS/WEEE Regulated standards**
- **Soil, river water, and coal ash regulatory standards**
- **Dioxins and PCB regulatory compliance standards**
- **Metal, solder, and silicon dioxide related standards**
- **Food-related standard materials**

Contact: The Japan Society for Analytical Chemistry

Development and Sales of Capillary Columns for Gas Chromatography



Gas chromatography is a widely used technique for the analysis of organic compounds, employing quartz capillary columns coated with selective stationary phases.

Our company designs and develops capillary columns with a wide range of characteristics tailored to the measurement of diverse chemical substances.

※ Sales are conducted by EIS Japan Co. Ltd. a non-consolidated subsidiary

Technological Development

Next-generation synchrotron radiation

Nano Terasu

Using Nano Terasu, we accelerate industry–academia collaborative technology development in fields such as the environment, construction, food and life science through visualization of the state of matters in question.

Our activities include:

- **Analysis of the type, structure, properties, and temporal changes of matter**
- **Analysis of the function and structure of biomolecules**
- **Design and development of new materials and devices**

Chemical analysis

- **Simultaneous and comprehensive analysis of chemicals in environmental and biological samples**
- **High-sensitivity chemical analysis and instrumentation for environmental and biological samples**
- **Biodegradability testing of chemicals**
- **CO_2 fixation experiment**

Restoration of biodiversity

- **Breeding and conservation of endangered species**
- **Cultivation and transport of seaweed seedlings**
- **Restoration of aquatic vegetation**

Ecological survey and analysis

- **Survey and assessment of seafloor ecosystems by deep-sea probe**
- **Biological surveys in offshore oceanic areas**

Risk assessment

- **Ecological impact assessment using image analysis**
- **Ecological risk assessment of pesticide degradation products**
- **Identification of high-risk chemicals based on comprehensive analytical and toxicity data**
- **Risk assessment using alternatives to animal testing**
- **Causal analysis of environmental factors and human health risks**

DNA analysis

- **Simultaneous detection of multiple taxa using eDNA analysis**
- **eDNA analysis in the deep-sea environment**
- **High-precision quantitative eDNA metabarcoding**
- **Food source estimation for endangered species**
- **Early cancer diagnosis using microRNA**

AI and Big data

- **AI-based species identification and microplastic measurement**
- **AI-based automatic shape analysis of human milk teeth**
- **Health risk analysis and assessment using AI and big data**

Human Resources Development

Our institute is committed to developing highly skilled experts in chemical analysis, biological analysis, and applied life sciences. We support the acquisition of professional qualifications, such as Professional Engineer and Certified Environmental Measurer, and enhance technical capabilities through ongoing training in advanced analytical techniques. By continually embracing new technologies and accelerating innovation, we strive to deliver cutting-edge services.

Collaborative Research Center

R&D in Food Safety and the Medical Field

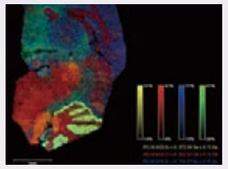
Food and Life-Science Laboratory

Using diverse analytical techniques, including biochemistry, molecular biology, cell biology, and morphology, we support the development of diagnostic and therapeutic methods for intractable diseases such as cancer, as well as clinical studies of rare diseases. We also provide R&D support for basic research, drug discovery, and functional food development.

Protein Analysis and Evaluation of Disease and Drug Efficacy

Using advanced analytical technologies, we perform comprehensive proteomic analyses of diverse samples, including skin, liver, ES cells, and iPS cells, to support the discovery of disease markers, diagnostic tools, and drug efficacy indicators.
We also offer mass imaging using next-generation mass spectrometers, enabling applications such as novel allergen identification.

MALDI mass spectrometer



Spatial distribution analysis in tissues using mass spectrometry imaging

Advanced Genetic Analysis Technologies

We provide comprehensive support for advanced DNA and RNA research, including extraction, quantitative PCR–based gene expression analysis, DNA sequencing, ChIP, RNA-binding protein immunoprecipitation, and next-generation sequencing (NGS) for metagenomic and gut microbiota analysis. We also develop ultra-early cancer detection methods using microRNA methylation analysis.

DNA/RNA extraction process

Genetic analysis using next-generation sequencing (NGS)

Analysis of Functional Nutrients, Synthetic Chemicals, and Metabolic Products

We support testing to label and highlight nutritional components in commercial foods and to evaluate their functional properties.
Using LC-MS/MS and GC-MS, we perform qualitative and quantitative analyses of natural and synthetic compounds and their metabolites across a wide range of samples, including those from cell cultures, animal studies, and clinical trials.

Food inspection process

LC-DAD-ELSD and LC-MS/MS

Room Health Check (IDEA Life Care Service)

For individuals who experience discomfort, itching, or coughing during seasonal changes, we offer “Room Health Check” services.
The Room Health Check assesses indoor environmental risks by measuring DNA levels of allergens—such as bacteria, mold, pollen, and dust mites—present in household dust. By quantifying the hygiene condition of living spaces, this service provides a clear evaluation of potential health risks in the indoor environment.

Examples of indoor allergens

Sample treatment process

R&D Leveraging Subtropical Regional Characteristics

Research Institute on Subtropical Ecosystems

Established in 2010 in Nago City, Okinawa Prefecture, the Research Institute on Subtropical Ecosystems leverages the subtropical climate and local resources, including seawater-based large-scale breeding facilities. The institute conducts research and development focused on Okinawa’s environmental conservation, ecosystem protection, and habitat restoration for rare species.

Initiatives Related to Blue Carbon

Regeneration and creation of rare seagrass and seaweed species

Okinawa’s shallow coastal areas are rich in biodiversity and have strong potential as blue carbon ecosystems. Through research and development of seedling production and transplantation techniques for rare native seagrass and seaweed species, we support the restoration and creation of valuable marine vegetation.

Seedling production of seagrass species in large outdoor ponds

Seagrass seedlings (Germinated *Thalassia hemprichii*)

Cultivation of valuable algae

Biofuels and biomaterials contribute to carbon neutrality by utilizing plants that absorb atmospheric CO_2. In addition to microalgae, we develop cultivation techniques for large seaweed species suitable for coastal environments.

Cultivation of microalgae

Cultivation of large seaweed (*Caulerpa lentillifera*)

Conservation and Restoration of Rare Species and Ecosystems

We support the restoration of declining coral reefs through research on coral seedling production and transplantation in natural marine environments. We also develop land-based aquaculture technologies to restore populations of valuable aquatic species affected by habitat loss, including sea urchins and giant clams.

Coral propagation and seedling cultivation

Tripneustes gratilla (collector urchin)

R&D in Environmental Survey and Data Analysis

Institute of Environmental Informatics

- Development of numerical prediction models
- Development of environmental survey and analysis methods
- Development of ecosystem analysis methods

System Development Related to Disaster Prevention, Mitigation, and Information Management

Center for Development of Information Technology

- Development of Disaster Prevention, Environmental, and Construction Systems
- Support for Mobile Content Development
- Support for the Operation of Earth Observation Systems

Facility Overview

1 Institute of Environmental Ecology (Main Research Bldg.)

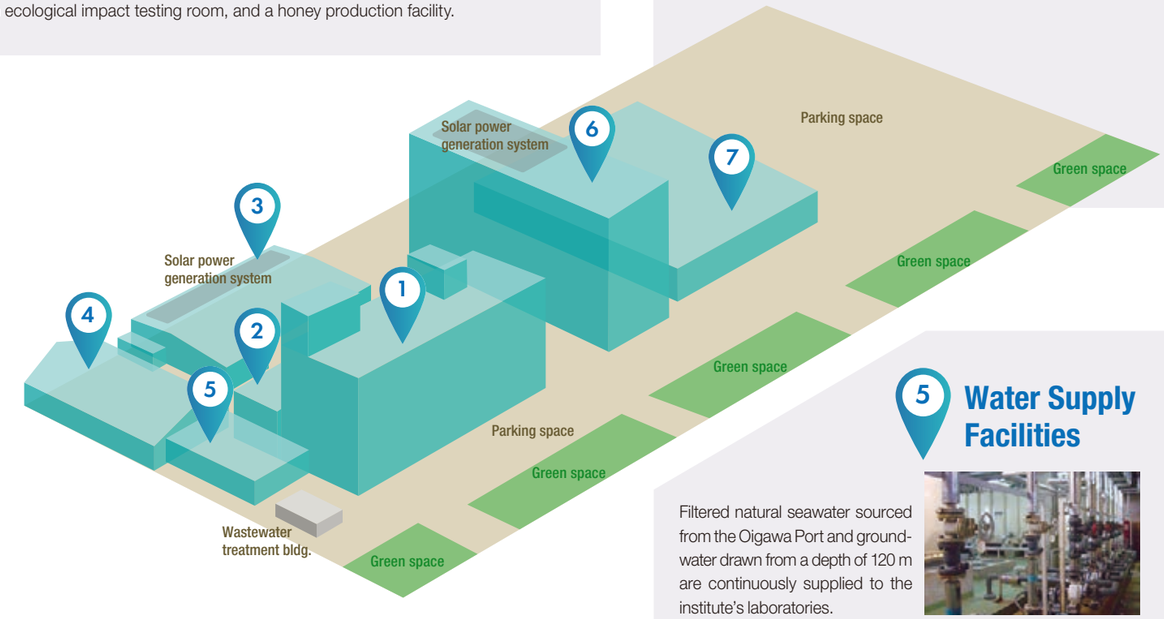
4 stories above ground, total floor area 2,674 m²

This facility is designed for trace chemical substances analysis. The 2nd and 4th floors house chemical hazard response laboratories equipped with high-precision analytical instruments, including high-resolution GC-MS, GC-TOF/MS, LC-MS/MS, and ICP-MS. The 1st floor includes a radiation measurement room, an ecological impact testing room, and a honey production facility.

2 Physics and Chemistry Lab.

2 stories above ground, total floor area 371 m²

Laboratories are equipped for grain size composition and ignition loss analysis, as well as standard sample preparation, biological pretreatment, and microplastics analysis.



※ All of our electricity comes from renewable energy.

5 Water Supply Facilities

Filtered natural seawater sourced from the Oigawa Port and groundwater drawn from a depth of 120 m are continuously supplied to the institute's laboratories.

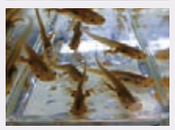
6 Life Science and Advanced Informatics Research Center

6 stories above ground, total floor area 4,342 m²

The 6th floor features a hall with a capacity of up to 156 people. The 5th floor houses chemical analysis laboratories equipped with automated sample preparation workstations, advanced analytical instruments, and a Biosafety Level 2 testing facility. The 3rd and 4th floors include sample freezer facilities and contamination-controlled rooms for genetic analysis. The 2nd floor contains experimental laboratories with sorting rooms, while the 1st floor is equipped with a variety of constant-temperature rooms.

3 Bio-Effects Lab.

Total floor area 433 m²



Facility is equipped with laboratories for ecotoxicity testing, fish breeding, and high-precision temperature-controlled experiments.

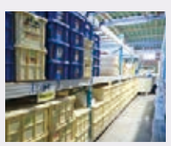
4 Bio Experiment Lab.

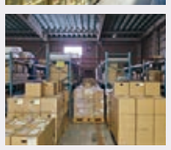
Total floor area 399 m²

Filtered seawater and groundwater outlets support experiments with aquatic organisms using tanks of up to 30 tons in capacity.

7 Research Equipment and Sample Storage Bldg.

Total floor area 1,655 m²





The facility includes laboratories for pretreatment of biological identification samples, as well as storage areas for survey equipment and analyzed samples.

Sustainable Design of the Center

- **Double-wall construction**
  An air layer between walls enhances thermal insulation and protects against salt damage.
- **Low-E glass**
  Special metallic coating film improves thermal performance and reduces solar heat gain.
- **Metal-faced insulating sandwich panels**
  Exterior walls provide high insulation performance and improved durability and maintenance efficiency.
- **LED lighting and motion sensor**
  Energy-efficient LED lighting with motion-activated controls reduces power consumption.
- **Solar panel**
  Rooftop solar power system installed (30 kW capacity).

Contingency Plan

In the event of a disaster, the Center will function as a tsunami evacuation facility under an agreement was signed with Yaizu City (signed July 6, 2023).

- **Tsunami countermeasures**
  Evacuation to the 6th-floor hall is available in the event of a tsunami (capacity: 160 people).
- **Secure power supply in case of power outage**
  An emergency generator ensures power supply to the 6th-floor hall during outages.
- **The availability of toilets during disasters**
  Toilet facilities remain operational during disasters through elevated water tanks, reinforced pipe shafts, and emergency drainage pits.