

Spring 2021

LITTERAE POPULI

A news magazine presented by Hokkaido University



Recent News from Hokkaido University



Litterae Populi

Litterae Populi is a bi-annual magazine with the latest news about Hokkaido University. Its name is Latin for “letters of the poplar trees.”

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pr@oia.hokudai.ac.jp
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Edited by the Litterae Populi Planning and Editing Team
Cover photo by Akihito Yamamoto (HARE-BARE SHA-SHINN)
Photos by Hiromi Terashima (Kotoha-sha)
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Cover photo taken at the Ono Pond

Feature: Pioneering

Hokkaido University will celebrate the 145 years since its foundation as Sapporo Agricultural College.

The university has continually inherited the frontier spirit that it has fostered over its long history, and it has pioneered as a base for the creation, transmission and demonstration of knowledge in order to help solve global issues.

Under the theme of pioneering, this feature highlights three organizations.



Photo of School of Engineering



Chemical reaction design and discovery (CReDD) changes society

The ICReDD laboratory, where experimental science is practiced daily to verify chemical reactions.



The Institute for Chemical Reaction Design and Discovery (ICReDD)

The Institute for Chemical Reaction Design and Discovery (ICReDD) was established as a new research center under the World Premier International Research Center Initiative (WPI). It will lead the world with the aim of developing chemical reactions that will bring about a prosperous future.



The World Premier International Research Center Initiative (WPI) is a project of the Ministry of Education, Culture, Sports, Science and Technology. This program aims to build “globally prominent” research centers whose research standards are so high and whose research environments are so outstanding that frontline researchers from around the world will flock to them.

The Hokkaido University Institute for Chemical Reaction Design and Discovery (ICReDD) was established in October 2018 as a new research center under the WPI. It aims to develop new chemical reactions more efficiently based on the three pillars of computational science, information science and experimental science.

Innovating the discovery of chemical reactions

Various chemical reactions surround us. Humankind has improved its living standards by discovering various chemical reactions. Controlling chemical reactions is essential for solving many issues facing us and for realizing

prosperous societies.

In conventional studies, individual chemical reactions predicted based on the experience and knowledge of researchers are confirmed in experiments. Researchers have groped in the dark for unknown chemical reactions and molecules, reaching their goals only after repeated trial and error. It can take hundreds and thousands of experiments for a single chemical reaction to be developed.

This insufficiency has been a major barrier to conventional chemical reaction development, as it has been very time consuming and the number of chemical reactions elucidated has been limited.

What is epoch-making about ICReDD is that it incorporates computational science and information science into chemical reaction development. Its theory-first approach enables significant reductions in the time required for such development.

In computational science, chemical reaction path networks are calculated through automated searches based on quantum chemistry calculations. The artificial force-

induced reaction (AFIR) method, which is a key ICReDD technology, is attracting global attention.

To predict a chemical reaction, it is necessary to predict all the movements of the atoms, which play a leading role in chemical reactions. However, it has been difficult to study all the possibilities in experiments, due to the enormous time and work required. Then the AFIR method was developed. In this calculation method, a virtual artificial force is applied between molecules or fragments within a molecule to induce structural changes. By repeating this procedure, a path in the transformation from a given reactant to an unknown product can be calculated, and by analyzing the reaction path network obtained, an enormous number of unknown reactions can be predicted.

“A database of chemical reactions predicted by the AFIR method has been compiled over the course of about a year, and approximately 200,000 chemical reactions have been registered so far,” says Professor Satoshi Maeda, Director of ICReDD.

Information worth studying is then extracted from many of the calculated chemical reaction paths using information science) to narrow down the optimal experiment conditions. The reactions narrowed down this way are verified by experimental science. This means the possibility of targeted experiments that can significantly hasten chemical reaction development.

“The discovery of chemical reactions has long depended on the preconceptions and experience of researchers, and it was necessary to escape the bounds of that history,” says Specially Appointed Associate Professor Yasunori Yamamoto, Administrative Director of ICReDD. “Direct discovery, instead of repeated trial and error, is what this research center makes possible.”

An inverse approach can also be taken. It is possible to predict the feasibility of a chemical reaction that was conceived by a researcher who practices experimental science from the aspects of computational science and information science and to present a shortcut to its realization. The integration of the three fields enables interactive approaches.

A center for social contribution

Thanks to its epoch-making efforts, ICReDD has produced various results. One example is the synthesis of difluoroglycine derivatives.

α -amino acids are the structural units of the proteins that form life. Used for the production of pharmaceuticals and food additives, these organic compounds are essential to our lives. It was known that increased metabolic stability, improved pharmacokinetics and other effects can be expected by introducing fluorine atoms into the skeleton of an organic compound; however, there were no efficient methods for chemically synthesizing α,α -difluoroglycine, which is an α -amino acid into which fluorine atoms are introduced.

Therefore, comprehensive searches were made for synthesis routes through AFIR-based analyses. Three simple



An experiment (photographed before the pandemic).



and readily available compounds were found, indicating that those compounds were appropriate starting materials for synthesis.

By conducting additional analyses based on the AFIR method, ICReDD achieved the chemical synthesis of α,α -difluoroglycine in only two months. “The introduction of fluorine into glycine and other important molecules is valuable in pharmaceuticals development,” says Director Maeda. “As internal degradation is controlled by the introduction of fluorine, it may become possible to reduce the medicine dosage frequency to once a day from the current three times a day. This chemical reaction will be useful as a method for constructing various fluorine-containing derivatives.”

In 2010, University Professor/Emeritus Professor Akira Suzuki of Hokkaido University won the Nobel Prize in Chemistry for a “cross coupling reaction”. This reaction, which efficiently links carbons, has been applied to the synthesis of various pharmaceuticals and is still generating trillions of yen in profits worldwide every year. Director Maeda expressed his enthusiasm: “We aim to create many wonderful chemical reactions at ICReDD such as the one discovered by Professor Suzuki. By following the achievements of the professor, we want to make it a research center that can deliver great social contributions.”

The MANABIYA system

ICReDD aims to establish chemical reaction design and



An open lab where ICReDD researchers gather for lively discussions.

discovery (CReDD) as a new academic field by integrating three fields. However, far too few researchers are familiar with all three fields.

Director Maeda says, “The fostering of young researchers is one of our institute’s missions.” One effort toward the achievement of this mission is the MANABIYA system.

Under the MANABIYA system, young researchers and students from universities and research organizations in Japan and abroad stay at ICReDD for two weeks to three months to learn methods for developing new chemical reactions. In the learning process, they also attempt to work through their own challenges and discover new research seeds. It is an ideal system for globally disseminating and utilizing rational and efficient development methods accumulated at the Institute by fostering young researchers. “Although we haven’t accepted researchers from overseas this academic year due to the pandemic, we’ve accepted some from within Japan and we’ve made many research presentations and conference presentations jointly with them,” says Director Maeda. There is also a plan to accept

researchers online in the future.

Becoming a global research center

It has been just over two years since ICReDD was established. The institute, which started with 14 researchers, now has 65 researchers and 10 office workers.

The number of research papers presented has also increased, from 87 in FY 2019 to more than 100 in FY 2020.



Photographed before the pandemic.



A synthesis workflow automation system manufactured by Chemspeed Technologies AG (a synthesis robot that can perform automated chemical reactions).

Administrative Director Yamamoto expresses his feeling of accomplishment: “We’ve progressed considerably in the last two years.”

Aiming to become a global research center, ICReDD



“Catalyst” news posters, from which the general public can learn about chemical reactions easily and enjoyably.

Catalyst
QR code



URL: <https://www.icredd.hokudai.ac.jp/about/the-catalyst>

is also active in international exchanges. It held the 3rd ICReDD International Symposium in February, where domestic and international researchers at the forefront of fields related to chemical reaction design gathered online and shared their progress and research ideas. Efforts to seek new integrated research projects within the university are also made through online interdepartmental symposiums and other measures.

A synthesis robot that can perform automated chemical synthesis has recently been introduced. The first in Hokkaido, it is one of only three in Japan. “For organic synthesis and other experiments, researchers need to come

to the lab to perform experiments,” says Director Maeda. “However, we aim to reduce the number of researchers because of the pandemic and for other reasons. For example, an experiment that had required three researchers can now be performed by a single person using this synthesis robot. Complete remotization may become possible in the future. The use of robots is one method for achieving our goal of innovating the discovery of chemical reactions. A day may come when chemical research can be conducted remotely.”

While steady results have been achieved, issues remain. Achieving a diversity of members is important for the formation of an international research center.

ICReDD has a personnel target of consisting of at least 30% foreign nationals, and the current percentage is 37%. Director Maeda says, “Although we’ve achieved our target, it won’t be easy to maintain it in the future. We’ll continue to provide support to improve the living environment for international researchers working in the center and to allow them to focus on their research.”

Under the slogan “Revolutionize Chemical Reaction Design and Discovery,” ICReDD will continue to make progress in raising world standards and playing a leading role in the world.



Professor Maeda (left), the Director of ICReDD, with Specially Appointed Associate Professor Yamamoto, the Administrative Director of ICReDD Research that leads the world is being conducted through close collaboration between the research and office sections.



The Center for Human Nature, Artificial Intelligence, and Neuroscience (CHAIN)

An international symposium in November 2019.

Integrating wisdoms and exploring the frontiers

The Center for Human Nature, Artificial Intelligence, and Neuroscience (CHAIN) was established as Japan's only research center specializing in hybrid research and education in the humanities, social sciences, neuroscience and AI. With the mission to create new knowledge on the nature of human existence, the Center conducts research and education taking advantage of the strengths and characteristics of Hokkaido University as a leading research university.

In July 2019, the Center for Human Nature, Artificial Intelligence, and Neuroscience (CHAIN) was established as a university facility and it launched its activities. CHAIN's mission is to provide interdisciplinary research and education that integrate arts and sciences at the intersection of the humanities, social sciences, neuroscience and artificial intelligence (AI), i.e., to be a place where new knowledge is generated.

Led by its director, Professor Shigeru Taguchi, CHAIN has five full-time specially appointed faculty members, three postdoctoral fellows, and 28 part-time faculty members from ten departments of the university. "By 'human nature', I am pointing to a new field of inquiry concerning the question of what it means to be human," says Director Taguchi. "Research on neuroscience and artificial intelligence is moving into the territory of the humanities and social sciences." Self-awareness is an example. How do

I appear to other people? How can I know this when I am not these others? We can approach such questions through science. Thus new knowledge emerges out of an interaction among philosophy, neuroscience and artificial intelligence. The Center for Experimental Research in Social Sciences, one of the internal partners of CHAIN, owns a magnetic resonance imaging (MRI) device exclusively for experimental use, with which researchers can probe into the brain activities of subjects as they perform various tasks. Using this device, researchers in CHAIN have carried out neuroscientific experiments on the consciousness of self and other. They have also conducted simulation experiments using deep learning. The CHAIN team is running an AI with a "superimposition mechanism" in a virtual environment to reconstruct the process by which the distinction between self and other emerges as a result of learning through a simple and universal mechanism.



In terms of education, CHAIN began to recruit graduate students to an educational program in April 2020 and accepted students exceeding the planned capacity of 20. The program consists of three pillar contents: coursework, summer/winter schools, and internship. Students will receive a diploma (completion certification) after completing it by earning a predetermined number of credits. In the coursework, students acquire the basic knowledge necessary to conduct further research. As they come from different academic backgrounds, each student tailors their course plan to their needs. Students are offered with a list of courses divided into three categories, humanities and social sciences (e.g., philosophy and psychology), information science (e.g., deep learning) and neuroscience, and are expected to study subjects outside their major to obtain credits. In the summer/winter schools, students and faculties engage in interdisciplinary discussions with leading researchers from around the world. In the internships, students work on practical problems at research institutes and partner companies in Japan and abroad, where they can take advantage of personal connections and networks they foster in the summer/winter schools. Many partner

companies and other organizations are willing to accept internship students, indicating the high expectations for human resources in this field.

A hub in pursuit of "a new understanding of human nature"

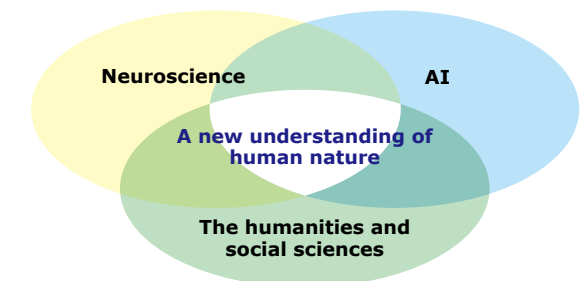
The largest event hosted by CHAIN in the two years since its foundation was the international symposium entitled *Adventures in Consciousness Science: Exploring the Crossover between Philosophy, Neuroscience, AI, and Robotics*, held in November 2019. World-renowned researchers were invited from overseas, and discussions were held on state-of-the-art research results and future prospects. "It was quite a success with more than a hundred participants from all over Japan," says Director Taguchi. "CHAIN is attracting more and more attention."



The meeting space at the Center with workspaces for post-doctoral fellows and graduate students.



The Center's logo. The interlacing design represents the overlap between different fields of research which cultivates the creation of new knowledge on human nature.



Eye-tracking device. The research group of Specially Appointed Associate Professor Masatoshi Yoshida, a full-time faculty member of the Center, conducts research using eye tracking and neural activity measurements to elucidate the brain mechanisms of schizophrenia.

Interest in CHAIN's activities is also high among undergraduates, for whom there are no courses at present. The Center's faculty members are communicating on social media (hashtag: #CHAIN_HU) with the motto "Do something exciting," and they are receiving good responses. Students are also holding voluntary study groups on cognitive science. For undergraduate education, there are discussions about offering subjects that allow students to acquire basic literacy in ethical, legal and social problems that may arise in the process of the social implementation of AI and neuroscience. "It's one of the hottest fields where new knowledge is actually being created," says Director Taguchi. He expresses enthusiasm for the future: "CHAIN started out with the homey atmosphere of a family business, but with the expansion of activities, it will be necessary to establish a system for organizational efforts. We're trying to create an environment where students will work in this field with interest and enthusiasm."

It will take a couple more years until the world sees the first graduates from this educational system, but CHAIN is already bringing out steady outcomes both in terms of research and education. Its presence as a hub for international collaborative research is increasing day by day. CHAIN is progressing steadily to pioneer a new field.

Career Center

Linking students with society through career support keeping up with changes in the social environment

To support students' first steps into society, the Career Center plays an important role as a place of practical and systematic career designing. The Center provides high-quality job hunting support based on the aptitude of individual students, while keeping up with "new normal" post-pandemic society.

Efforts toward the establishment of the Career Center started in 1998 in the Employment Information Library of the Academic Affairs Department. At that time, two workers provided employment information and guidance for students. In 2004, with the reorganization of national universities into corporations, the Career Center of the Academic Affairs Department was established under the strong leadership of the then President of Hokkaido University, Professor Mutsuo Nakamura. In 2017, it was reorganized as the Career Center of the Institute for the Advancement of Higher Education. "The present all-campus system of career education support in addition to job hunting support started here, although individual faculties have provided careful job hunting support," says the Director of the Career Center, Specially Appointed Professor Kiyotaka Matsuura.

At the Career Center, qualified advisors and experienced counselors provide consultation for various employment-related matters utilizing their expertise. In addition, the Career Center holds many employment guidance events

and seminars throughout the year to provide information useful for job hunting. The Center also supports early career education such as internship programs for first- and second-year undergraduate students.

A major event of the Career Center is a company research seminar held jointly with the Hokkaido University Alumni Association, Elm. It is held annually as an opportunity for students to listen directly to individual explanation given by people from each company and organization and discuss with them about the business details in each industry. It is one of the largest events of its kind in Japan, with participation by totally approximately 700 companies and organizations and cumulatively more than 20,000 students. Approximately seventy percent of Hokkaido University students find their jobs outside Hokkaido, so companies and organizations from all over Japan gather here. In this March, many students, mainly in their third year of the undergraduate course or in their first year of the master's course, participated in this seminar and collected information useful for their career choices before

Feature:
Pioneering

going out into the world that is facing an uncertain future due to the pandemic, although this year's seminar was given only online using Zoom.

Job hunting support in pandemic times

Job hunting activities in FY 2020 were quite different from those in ordinary years due to the pandemic. Many students felt anxious, as there were fewer opportunities for students to get together and share employment-related information with their classmates because university classes were given online.

The Career Center has taken support measures to address the pandemic, while continuing its job hunting support activities. Job counseling by appointment, which had been given in personal interviews, phone and other various means, is now given mainly via Zoom and other remote services. Events that were held face to face in ordinary years are now held online and videotaped so that students can watch them later at home. Career support information, which was provided in print or face to face, is now accessible from the Education and Learning Management System (ELMS). Various measures are taken to allow students to collect information to the same extent as in pre-pandemic days.

The methods of employment information provision and interview screening by companies and other situations have changed due to the pandemic, the Career Center have been giving some new guidance different from before. In online interviews, for example, students need to think about their clothing, hair, onscreen appearance, speaking with time delay, and so on. Especially, regarding where to look when communicating with people through a computer screen, students are advised to look at the screen, but to look at the camera when they have something they really want to say.

The Career Center's staff seem to be carrying out their daily tasks with the thought of giving even more careful support than before to meet the needs of students anxious about their job hunting activity in the changed situations.

Providing better support

A challenge that has been addressed in job hunting support activities carried out in the Career Center is the improvement of support for international students. With the increase in number of international students studying



A company research seminar in March 2019. The seminar is held for about ten days around this time every year.



Mini job hunting course (online). This is a practical course with a main focus on small group work, which is useful for networking by job-seeking students.

at Hokkaido University, requests for consultation from these students have increased. Especially, because the number of the international students who want to work for Japanese companies is increasing, it is necessary to provide consultation for such students with a wider range of specialties and languages. Director Matsuura says, "Although we're doing our best with a limited staff, it's difficult to satisfy the various needs of international students." To keep up with the globalization of companies and universities, job hunting support must be diversified.

For both international and Japanese students, it is important to start job hunting early in the time on campus, instead of starting in the third year of the bachelor's course or the first year of the master's course. Early internship experiences, for example, are useful for thinking what kind of work suits them. "Many students have said their internship was an eye-opening experience that made them to think seriously about their future and to find what to do before graduation," says Director Matsuura. He encourages students by saying "Let's think about your career together from an early stage."

The Career Center continues providing support for students to open paths into society through services tailored to the specialty and aptitude of each student.

Located on the 1st floor of the Clark Memorial Student Hall, the Career Center is visited by approximately 2,000 students annually.



Specially Appointed Professor Matsuura, who serves as the Director of the Career Center and leads 14 staff members in support of career design and job hunting.



Employment-related materials at the Career Center. Students can read job hunting activity reports of graduates and recollections of students who have passed the civil service examination.



Interview with the president

Guest

SUGIE Kazuo

Director (Standing Audit & Supervisory Committee Member), Sapporo Holdings Limited

Director General, Central Council for the Promoting of Industrial Education
Director, Asia/Pacific Cultural Centre for UNESCO

Mr. Kazuo Sugie has had experience in a wide range of practical operations, including research, manufacturing, planning and sales, for 30 years since he joined Dainippon Ink and Chemicals, Inc. (presently DIC Corporation). After becoming an executive, he implemented management reforms under the management vision of "Color and Comfort by Chemistry" and led the sustainable growth of the company. He holds various positions and is active at the forefront of society.

President Kiyohiro Houkin, who has been working energetically to make Hokkaido University like no other university since assuming office in October 2020, interviewed Mr. Sugie, a Hokkaido University alumnus, about his life and corporate philosophy and about the partnership between the University and the alumni association.

Promoting communications and a sense of belonging will lead to the growth of the organization.

Dedication to study during school years

Houkin: First, where are you from? Could you also tell me your story from boyhood to enrollment in Hokkaido University?

Sugie: I come from Urahoro Town in the Tokachi region of Hokkaido. I was the kind of child who'd always ask adults "Why?" A town high school had just opened, so I entered as one of the first students. Being a small and local school, all the students were friends and had fun. After that, I entered Muroran Institute of Technology. In my fourth year, I heard about graduate school from a teacher who came from Hokkaido University as a lecturer every week, and I decided to aim for it. I studied the hardest during that time as it was very difficult to enter Hokkaido University from another university.

Houkin: I don't think many people went to graduate school in those days. You must've been a hard worker.

Sugie: As I felt chemistry was easy after memorizing the periodic table of the elements, I was good at the subject since junior high school and high school. I also liked to read since childhood and I read many books, so I was also good at contemporary Japanese language. Although I wasn't good at subjects that required memorization, I studied English very hard.

Houkin: What research did you conduct in the master's degree? And how did you decide your career path after completing the degree?

Sugie: I conducted research on extracting compounds from oil components. I formulated a theory, wrote a theoretical equation and proved it in an experiment by myself. It was more like chemical engineering. Because the environment allowed me to freely conduct a research, I did everything—from determining a theme to making devices. I remember feeling happy when a teacher at my master's thesis defense complimented me, saying "What you're doing is interesting. It can be applied to the fabrication of industrial devices." I wanted to keep engaging in chemical research after completing the course, so I joined Dainippon Ink and Chemicals, Inc. (presently DIC Corporation).

Houkin: At Hokkaido University, ICRéDD (the research center presented in Feature 1) is promoting the development of chemical reactions that can revolutionize society. Listening to your story, I truly

feel that chemistry has been a characteristic strength of Hokkaido University, and one that continues to this day.

Sugie: I think Hokkaido University's research can lead in the field of chemistry, such as the work of Professor Akira Suzuki, who won the Nobel Prize. As many companies seem to be having trouble determining a future direction, I expect Hokkaido University to lead joint research with sponsoring companies.



Hokkaido University has traditionally been strong in chemistry, and I feel that this tradition remains today.

– Dr. Houkin

Consumer value in business development

Houkin: What kind of work did you do after entering the company?

Sugie: I entered the company to conduct research, but I was in the research department for only four and half years. After that, I was transferred to nine different departments over the course of 30 years, including production and planning, until I became an executive. I wasn't good at communications, so I started out by choosing science; even so, I worked as a supervisor of a manufacturing site and in the sales

and marketing departments. For decades, every time I changed position I initially did not like the job.[laughs].

Houkin: You must've had all kinds of experiences.

Sugie: When I was at a manufacturing site, I was called in even on my days off if there were out of specification products. I felt that defective goods owed to the workers' lack of a sense of identity as manufacturers, so I held workshops every week. As a result, they came to understand the meaning of product standards and purposes, and they came to identify

Because the environment allowed me to freely conduct a research, I did everything—from determining a theme to making devices.

– Mr. Sugie

with and feel responsible for the goods.

When I was in the marketing section, I wasn't good at talking with clients. Then I changed my approach to let others talk and just listen to them. When it comes to their specialties, clients have plenty to talk about and they even give me ideas about work. When I met insurance salespersons, I also felt that trust was important and that selling goods meant having customers buy your personality.

Houkin: Were you influenced by anyone, or can you remember any anecdotes from your activities at the company?

Sugie: When I visited the president of Yamazaki Baking Co., Ltd., I saw a poster with Peter Drucker's words: "What is our business? Who is our customer? What does our customer consider value?" I got the poster from the president and put it in my office when I became the president of my company. Although Dainippon Ink had about a third of the global market share for printing ink, our business of ink for newspapers, magazines and other paper printing was in the red. The clients of an ink company are printing companies, and they see value in ink with superior printing characteristics with low price. Clients of printed matter are consumers who see value in the acquisition of information. The method of information transmission has been shifting from print to digital, and we've shifted our focus to R&D to further improve chemical products used for information devices, namely, liquid crystal compounds and color filter pigments that are already in our product line. Although sales volumes have decreased, profit margins have increased. By following the words of Drucker and considering what consumers value, we've managed to change the company's composition. On our 100th anniversary, we changed our name to DIC. I instructed the section heads and chiefs, who would be the next generation leaders, to think of a new management vision. The result was "Color & Comfort by Chemistry." We were able to change our direction so as to provide sustainable products to the world by utilizing most of the company's management resources, thanks to Drucker's words, who made me realize that there would be eternal demand for the value of "colors," and not just of pigments as substances.

Solid partnerships to make the university like no other

Houkin: You're serving as the president of the Hokkaido University Elm Alumni Association. Could you tell me your ideas about alumni activities?

Sugie: For graduates, I think an alma mater is like a family. I think everyone wants to contribute to their family home, but when it comes time to make donations or conduct joint research, they hesitate to take action. First, it's necessary to foster a sense of belonging to Hokkaido University. If there's a good reason,



alumni will cooperate. For instance, it is important for the university to work on the purpose of the donation and research initiatives for the society. I want to keep supporting the university by bridging the gap between the university and alumni.

Houkin: Thank you. Focus has recently been placed on engagement management, that is, the establishment of trust-based relationships in which we interact with organizations on equal terms. Against such a background, the Elm Alumni Association is very important as a group of people sharing the same feelings and thoughts. A solid partnership with the Elm Alumni Association is essential for the consolidation of the management base and the promotion of industry-university collaboration. I believe that this time of your presidency is an opportunity to bring about changes.

Sugie: For the future of Japan, I want the national government to invest more in universities. At the same time, the acquisition of external funds is also necessary for financial independence as a corporation. Since you've clearly presented your vision for the revitalization and development of Hokkaido University and you've placed the importance on governance in management, what you need now is the community's support. If I ask businesspersons what they think about Hokkaido University alumni, most say they're quiet. Another thing that I often hear people say is, "Many graduates of Hokkaido University play active roles overseas." Others say that they have indomitable and independent spirits. I think it's

The phrase "Boys, be ambitious" has various interpretations, and I think it's connected with leadership education and entrepreneurship.
– Dr. Houkin

HOUKIN Kiyohiro

President, Hokkaido University

Born in Hokkaido in 1954. Graduated from Hokkaido University School of Medicine. Doctor (medicine) (Hokkaido University). Worked for Hokkaido University Hospital and other facilities since 1979. After working as a visiting researcher at the University of California, Davis, became an assistant professor at the Hokkaido University Graduate School of Medicine in 2000, professor of Sapporo Medical University School of Medicine in 2001 and professor of the Hokkaido University Graduate School of Medicine in 2010. After becoming the director of Hokkaido University Hospital/vice executive of Hokkaido University in 2013 and the director of Hokkaido University Hospital/vice president of Hokkaido University in 2017, assumed the present position in October 2020.



because of the historical background that people came from all over Japan to colonize Hokkaido. No other universities have so many students coming from all over the country. Looking at the number of international students, it is also a very diverse university. Considering that, Hokkaido University has sufficient capacity to rank among leading universities in the world.

Houkin: Thank you. Lastly, could you give a message to students and graduates?

Sugie: What kind of people are leaders? A leader and a head are apparently different. Being a head is simply about a hierarchical relationship. If one simply follows orders from the head and things don't work out, the head subordinate will just say that the head's order was a mistake. I believe the most important thing for a leader is to have the followers willingly work with the leader. The basis of my idea is that we can't work the way we want without the help from those around us, because a person's ability is limited. That's why I want students of Hokkaido University to become leaders who value teamwork. I think the university's Nitobe College education program is truly a step ahead of global education. Hokkaido University can be a global hub university in professional education, including leadership education. I want to keep supporting Hokkaido University as the family home of alumni.

Houkin: The phrase "Boys, be ambitious" has various interpretations, and I think it's connected with leadership education and entrepreneurship. I hope for your continued guidance, as I feel the need to advance by demonstrating the characteristics of the university a little more clearly in collaboration with the Elm Alumni Association. Thank you very much for today.

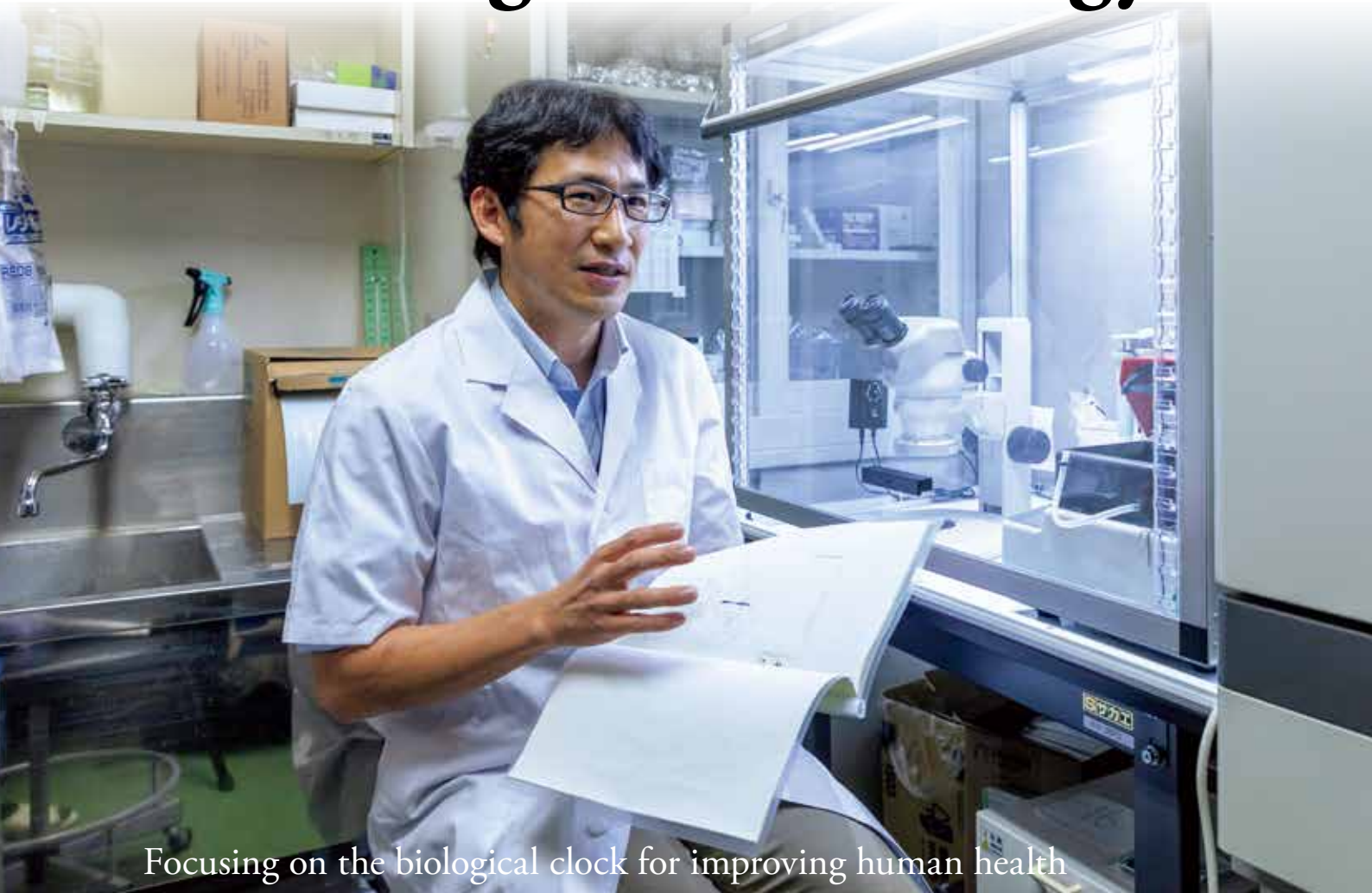
I want students of Hokkaido University to become leaders who value cooperation.
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Director General, Central Council for the Promoting of Industrial Education
Director, Asia/Pacific Cultural Centre for UNESCO

Born in Hokkaido in 1945. Graduated from the Muroran Institute of Technology Faculty of Engineering. Completed the master's degree of the Hokkaido University Graduate School of Engineering. Joined Dainippon Ink and Chemicals, Inc. (presently DIC Corporation) in 1970. Became a director in 2001, the president in 2009, the chairman in 2012 and an advisor in 2015. Active on the front lines of society even after retirement. Became the president of the Hokkaido University Elm Alumni Association in July 2019.

Refining: Chronobiology



Focusing on the biological clock for improving human health

Chronobiology

Biological clock plays a crucial role for mental and physical health

Circadian rhythms are approximately 24-h fluctuations in physiology, behavior (sleep-wake cycle), and physical performance. The biological clock located in the suprachiasmatic nucleus of the hypothalamus is the central circadian pacemaker and plays a crucial role in generating the circadian rhythm. The circadian pacemaker entrains to an environmental light-dark cycle caused by the Earth's rotation period of 24 h and regulates the internal temporal order of

YAMANAKA Yujiro

Associate Professor, Faculty of Education

Doctor (medicine). Expertise: Chronobiology. Dr. Yamanaka received his Ph.D. from Department of Physiology, Graduate School of Medicine, Hokkaido University. Dr. Yamanaka started his academic carrier in Graduate School of Medicine, Hokkaido University as Assistant professor (2010-2016) and assumed the present position in 2016. Dr. Yamanaka's research focused on the effects of light, physical exercise, and meal on sleep and circadian rhythm, which are closely associated with people's lifestyle in modern society. His future research success is greatly anticipated.

physiological function. As a result, we can be active during the daytime and sleep well during the night. Associate Professor Yujiro Yamanaka of the Faculty of Education specializes in chronobiology, which deals with the biological clock, and he has been pursuing comprehensive research on the effect of the biological clock on mental and physical health.

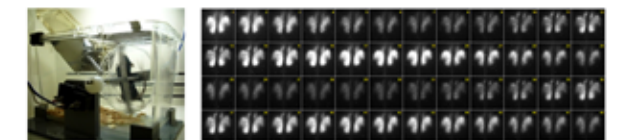
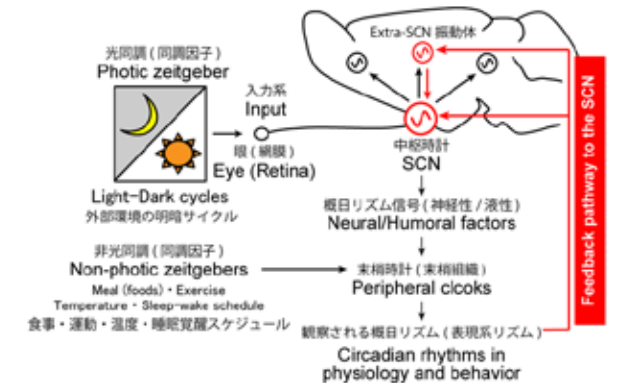
"When I was in high school, I had a goal of becoming a physical education teacher," says Associate Professor Yamanaka. After graduating from Nihon University Senior High School in Kanagawa Prefecture, he entered the Department of Sport and Physical Education, Kokushikan University. He had the opportunity to attend a lecture on exercise physiology, after which he started research under Professor Tsuyoshi Watanabe of the Department of Exercise Physiology. Associate Professor Yamanaka's graduation thesis was on "Effect of psychological satisfaction from mountain climbing exercise on diurnal variations in autonomic nervous activity in healthy elderly persons." In cooperation with friends of his mother who loved mountain climbing, he compared the diurnal variation of cardiac autonomic nervous activity on normal days to that on days when they went mountain climbing. The parasympathetic nervous activity during

nocturnal sleep was found to be greater on days when they went mountain climbing than on normal days. "Although I wasn't aware that the research was addressing circadian rhythm, the measurements in a 24-hour cycle might have been connected with my current research," says Associate Professor Yamanaka. Although he obtained the teaching certificate for health and physical education, he entered the master's course of the Graduate School of Education, University of Yamanashi, in the hope of continuing research on autonomic nervous system, which he had become interested in when writing his graduation thesis. He conducted research to create a normal value (diagnostic criteria) for assessing the cardiovascular autonomic function response to postural change together with Dr. Koichi Honma of the Department of Neurology, Chiba Cerebral and Cardiovascular Center. After presenting his first scientific article paper in English, seeing how his research results were reflected in clinical practice and feeling the difficulties and joys of research, his goal changed from teaching to research.

"As I thought I should do something different from others to survive in the academic world as a researcher, I looked into research on chronobiology," says Associate Professor Yamanaka. He focused his attention on the relationship between exercise and the biological clock, which not yet fully understood in those days. As he learned that pioneering research in this field was conducted at Hokkaido University, he decided to enter the doctoral course of the university's Graduate School of Medicine. He began to conduct isolation experiments in humans under Professor Ken-ichi Honma of the Chronophysiology Laboratory, Department of Physiology (formerly the Department of Physiology I) in 2004. Concurrently with research to clarify the structure of the human biological clock and the mechanism involved in phase-adjustment of human circadian rhythm by light and exercise, he also conducted animal experiments to clarify the brain mechanism of photic and non-photoc entrainment in humans, which was difficult to study in humans, and he acquired his doctoral degree (medicine) in 2008. Since then, Associate Professor Yamanaka has continued his research as a staff member of the Chronophysiology Laboratory. And since becoming an associate professor in the Graduate School of Education and establishing the Laboratory of Life and Health Sciences in 2016, he has been conducting research from broad perspectives, with a main focus on the biological clock and circadian rhythm.

Toward the social implementation of research results

A major research finding of Associate Professor Yamanaka is his elucidation of the non-photoc entrainment mechanism of the human biological clock. Concerning the human biological rhythm, a two-oscillator model has been proposed. The model consists of a central clock (the primary oscillator) that controls the core body temperature and melatonin plus a peripheral clock (the secondary slave oscillator) that controls the sleep-wake cycle. However, which oscillator is affected by exercise had remained unclarified for many years. Associate Professor Yamanaka found out in the isolation facility kept under the dim light condition that habitual exercise acts as a zeitgeber (synchronizer) for the secondary oscillator, which mainly



A hierarchical multi-oscillator system, which is controlled by a self-sustained circadian pacemaker generate and regulates the circadian rhythm. Dr. Yamanaka has been investigating the effect of daily scheduled wheel-running exercise on circadian rhythm of behavior and clock gene expression in the SCN in mice.

controls the sleep-wake cycle, and that there is a feedback pathway in which exercise secondarily affects the central clock via the oscillator that controls the sleep-wake cycle. He also conducted isolation experiments based on these results and found that the combination of timed exercise under bright light accelerates the reentrainment of circadian rhythm to a large shift of sleep schedule, which will help overcome jet-lag sleep disorders when one travels internationally. Based on this scientific evidence, Associate Professor Yamanaka has been supported the Japan national football team by providing a strategy for overcoming jet lag.

"The biological clock is fundamental and essential physiological functions for keeping our mental and physical health," says Associate Professor Yamanaka. "To maintain mental and physical health, it's important to understand the mechanism of the biological clock and to design the daily rhythm in consideration of our internal biological clocks vary from individual to individual." He is working on research to elucidate the mechanism whereby behavioral rhythms are fed back to the biological clock of mice, in parallel with research to elucidate the mechanism whereby light and exercise adjust the human biological clock. He is also active in joint research with companies in Hokkaido, such as research on the stress-reducing effect of fermented milk, the development of a wearable device for regulating sleep and biological clock and the development of a health-support app. He always strives to deliver his research findings to society while continuing chronobiological research.

Relaxation

Mountain climbing for a change!

Associate Professor Yamanaka has enjoyed mountain climbing since early childhood. He works hard on research every day, looking forward to those days when he can climb with his family while enjoying the flowers and scenery. The photo was taken in front of the Matterhorn (Switzerland).



Think and practice from “exactly halfway between” arts and sciences

Identify changes of the times, and predict the future



ONO Hiroyuki

SunBridge Inc. Chairman & CEO (at the time of interview)
United-bus Corp. President (from April 2021)

| School of Engineering - Graduate School of Engineering Graduate |

Mr. Hiroyuki Ono is operating a business to improve the sales and productivity of companies through the centralized management of customer information using cloud (online) computing services. He spoke with us about the background to his creative ideas and active behavior, looking back on his corporate activities and school days.

Please start by telling me about your current work.

A decade ago, companies usually conducted sales by organizing exhibitions, placing ads and conducting personal sales. However, the spread of the Internet has changed the situation completely. Customers obtain product information from websites. Therefore, a method called “marketing automation” was introduced. It redirects sales activities toward only those customers who have a certain

level of interest, through the centralized management and automatic analysis of information on customer behavioral patterns and motivation to buy. As a result, the sales and productivity of companies will improve dramatically. Business is a science based on calculable predictions, rather than on spiritualism. We support corporate activities by proposing such marketing mechanisms.

How did you spend your university days?

As an undergraduate, I conducted basic research on optical sensors in the Division of Applied Physics of the School of Engineering. In graduate school, I was interested in bionics and ventured into the unexplored field of artificial organ development. My joint research with an American university hospital was discontinued immediately before

my master’s thesis was due, so I had trouble. Even so, I managed to complete it. Thinking about the logical structure of research myself was a great experience. Besides studies, I was enthusiastic about rugby, traveling, tennis and other club activities, as well as playing in a band. In those days, I did everything to improve my communication skills in order to avoid becoming a biased person. I also held various part-time jobs, among which I put the most effort into teaching at a cram school. The school had a “class-based teacher assignment system,” so I was responsible for guiding my students. It was hard working long hours preparing for classes and giving makeup classes late at night, but I had a feeling of achievement and the experience became the foundation for my current job.

You found a job in a field totally different from science, didn’t you?

I thought about advancing to the doctoral course, but I joined Recruit Co., Ltd. and later left there for a venture company. The business world depends heavily on individual



expertise. I thought such expertise could be “structuralized” as something that could be scientifically reproduced, and I put that idea into practice. A key phrase I’ve been using for many years is “analog-digital conversion.” The world of relationships with customers is an “analog” art, whereas the world of technology is a “digital” science. I’ve practiced matching with customers by giving presentations on how they can use technology to solve their problems, as I think such matching is necessary and creates business opportunities. The analog world will never become completely digital no matter how hard we try. That’s why it’s so important to facilitate analog-digital conversion as smoothly as possible. Human resources who can play active roles “exactly halfway between the arts and the sciences” will be required in the future.

What do you try to do in everyday life to cultivate a creative point of view?

I watch what happens in emergencies—for example, in the Great East Japan Earthquake in 2011. In the world of IT, cloud services have increased dramatically, because of their cheaper prices than existing methods and the increased awareness of the importance of safety to ensure the continuation of corporate activities at times of disaster. In the days of the pandemic, what society values has changed completely, as can be seen in the general use of the term digital transformation (DX). For example, workers have shifted from commuting to working remotely, and non-



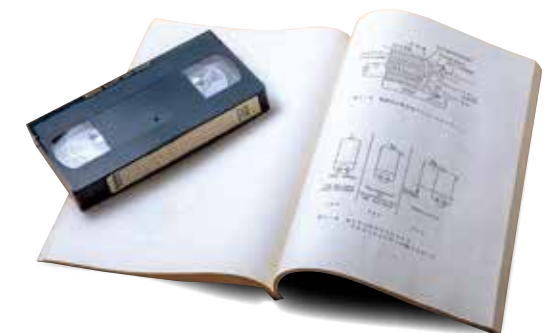
face-to-face sales and project activities and online corporate seminars have become common. By providing services to keep up with such changes, our company’s productivity has improved and our sales have increased significantly.

What do you see as the potential of Hokkaido?

Because of its extensive land and geographically advantageous position, I expect Hokkaido to play a central role in terms of economy, and I have a strong desire to be involved in the prefecture and give back to it. Its food self-sufficiency is 200%, which is the highest in the country by far, and there’s technology to produce delicious rice in a cold climate. New business models that integrate IT and agriculture have already emerged. I personally believe that food and health are the most important subjects for the future. I expect Hokkaido University to create new innovations, and I hope to work together with it.

Lastly, please give a message to the students.

When studying, it’s sometimes necessary to think autonomously and act on your own initiative. Even when you’re in such a situation, you’re in an environment where you can try different approaches, and that’s one advantage of the university. The same can be said about activities other than studying. Don’t hesitate to try innovative new things with an open mind.



Memorabilia from university days: a videotape of band activities and a master’s thesis written by Mr. Ono

PROFILE

Born in Hokkaido in 1964. Graduated from the Hokkaido University School of Engineering in 1987. After completing the master’s course of the university’s Graduate School of Engineering in 1990, joined Recruit Co., Ltd. and launched the commercialization of Internet services as the manager in charge of new projects. Involved in the creation of numerous new projects for domestic IT vendors. Has participated in the management of Sunbridge Group Ltd. since 2009, and assumed the current position in April 2021. His unique approaches and provision of services from the viewpoint of companies have always been highly valued.

A bridge between Hokkaido University and the world

This issue features contributions from Mr. Fanor Mondragón Pérez, who is active as a Hokkaido University ambassador in Colombia, and Mr. Makoto Hirata, who is active as a Hokkaido University partner in Mexico.



Dr. Fanor Mondragón Pérez

Emeritus Professor of Antioquia University, Medellín, Colombia. Member of the Colombian National Academy of Sciences

The Hokkaido University (HU) Ambassador and Partner Program is an excellent way to promote the university to the world and to create two-way communication with different universities, institutions, and regions. This kind of communication is especially beneficial for a country like Colombia, which has very little contact with its Asian counterparts.

For me, it has been a very good opportunity to collaborate with HU where I obtained my doctoral degree in 1984 with my thesis on the chemistry of coal conversion into liquids. Since my return to Colombia, with the help of my advisor the late Professor Koji Ouchi, I started a research laboratory working on renewable and non-renewable energy resources.

Through this, I have published more than 130 scientific papers, 8 patents and supervised 16 PhD theses.

Now through the Ambassador Program, my wish is to have more young people from Colombia who would like to carry out their Masters, PhD, or internships at HU.

At the same time, I also think it

will be very interesting for Japanese scholars to come to Antioquia to participate in joint research projects and to learn about the local culture.

The Ambassador Program is a good way to make this happen and I am most happy to give back to HU, the university that means a lot to me. Although there are not many exchanges between our universities due to the distance, the two-way learning will be very important for both universities. The University of Antioquia is the second largest and most prestigious university in Colombia, so its promotion to the world will make a difference to our students.

Last year, we were visited by Professor Kiyoharu Tadanaga, a materials scientist from the Applied Chemistry Department who delivered some lectures to the graduate students in Chemical Sciences.

Together with Professor Tadanaga, we filed an application to the Learning Satellite Program of HU. The proposal was approved for 2018 and 2019.

Under this program, two lecturers and 5 graduate students from HU

visited the University of Antioquia in November 2018 to deliver lectures and to carry out a mini symposium which was attended by students from HU and University of Antioquia.

Since then, we had two missions from HU to University of Antioquia as part of the Learning Satellite Program between both universities with the collaboration of Professor Kiyoharu Tadanaga, Professor Carolina Rosero, and Professor Toshihiro Shimada. We also have had some Colombian students doing research in HU for short periods of time.

Unfortunately, in 2020 we had to postpone some student visits to HU due to the pandemic. Professor Franklin Jaramillo from University of Antioquia was scheduled to deliver some lectures at HU as part of a HSI this year, but that activity was also cancelled.

We also have a student applying to the MEXT scholarship, if successful, she would like to carry out her PhD at Hokudai.

I hope that this year we will be able to resume active exchanges between the two universities.

Mr. Makoto Hirata

Representative, Mexico Office, Japan International Cooperation Agency (JICA)

I applied to become a partner, as I saw the inauguration of the Ambassador Partner System as a message for Hokkaido University to further promote international partnerships and I thought there must be something I could do as a graduate working in the international cooperation industry. I'm very honored to have been appointed as a partner as a result.

Latin America, in which I've been deeply involved during my career, is probably unfamiliar to Japanese, as it's far from Japan and in a different language zone. Even so, I feel that such unfamiliarity is exactly why I can repay the favor to my alma mater through my expertise and work experience there.

When I was a student, I felt—and I still feel—that Hokkaido University has an excellent environment, with great natural splendor, even though it's in downtown Sapporo. I was in the Laboratory of Horticultural Science of the Faculty of Agriculture. Under the policy of then Professor Katsuji Osawa that students of the Faculty of Agriculture should have experience growing vegetables, I cultivated all kinds of vegetables with the help of technical officials, using part of the field (approx. 600 m²) behind the faculty. Enjoying *jingisukan*

(lamb barbecue) on the campus lawn with friends from seminars and clubs is also a good memory, although I hear it's banned now.

I often hear the name of Hokkaido University during my JICA activities. I'm quite impressed by Hokkaido University's cooperative activities, such as research on zoonoses in Zambia, Africa, and cooperation on livestock farming in Bolivia, South America, to solve global-scale problems in natural science, a field in which the university has advantages. JICA also has many members from Hokkaido University who are active on the front lines, such as Director General Satoshi Yoshida (formerly in the Keiteki-Ryo student dormitory) of the Latin America and the Caribbean Department, who's also been a Japan Overseas Cooperation Volunteer; Chief Secretary Hiroo Tanaka of the Office of the President; and Chief Representative Jiro Takeichi of the Balkan Office (in Serbia). I feel that the great number of people involved in support for developing countries is an embodiment of Hokkaido University's frontier spirit.

Mexicans are kind to Japanese in general, as Mexico has pro-Japanese sentiment fostered by people of Japanese descent, starting with the Enomoto Colonization Company that was

led by Takeaki Enomoto, who landed at Chiapas State in the southern part of the country in 1897. There are also many Japanese people working and living in Mexico, as more Japanese companies are expanding to that country with the recent growth of economic ties between the two countries. There are many Japanese restaurants in downtown Mexico City with dishes as good as those served in Japan. Although the security problems of Mexico often attract attention, it's one of the most livable countries for Japanese in Latin America.

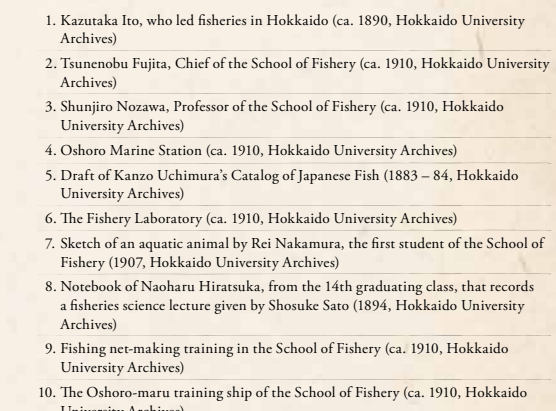
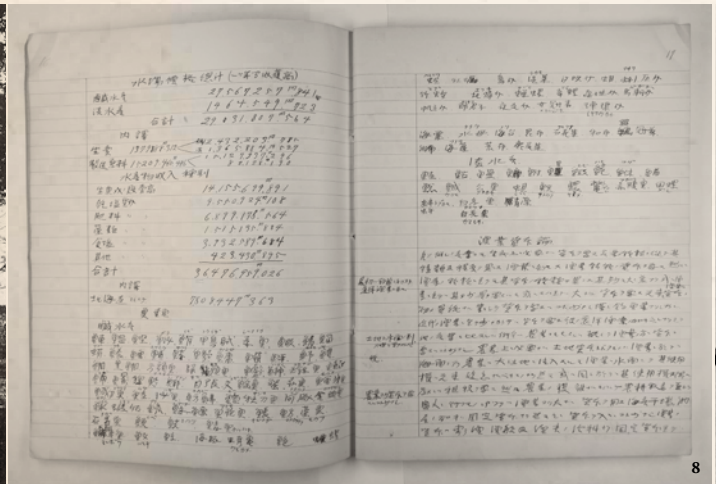
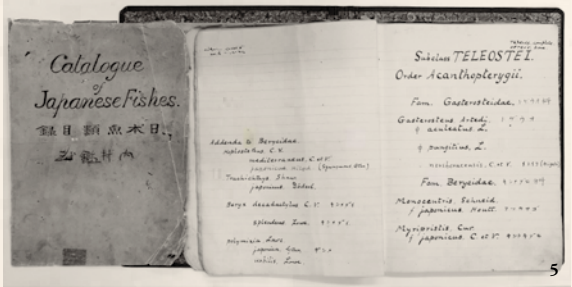
International society is now moving together to resolve common challenges by setting sustainable development goals (SDGs). Against such a background, Hokkaido University is expected to take the lead in promoting further industry-university-government collaboration by making the most of the human network of its alumni. I believe that people with experience and the willingness to take on new challenges fostered in the liberal academic culture of Hokkaido University can be leaders anywhere in the world. Although a mountain of challenges remains to be solved, let's put our energy into our tasks with the spirit of *keppare* (doing one's best).



1. Staff and researchers of Professor Tadanaga's laboratory
2. Professor Franklin Jaramillo's lecture for the course on solid state materials for batteries
3. Professor Shimada and Professor Jaramillo visiting Medellín with Japanese students
4. Japanese and Colombian students during lecture break



1. The Mexican flag in the Plaza del Zócalo at the center of Mexico City
2. The famous Japanese restaurant Kura in Mexico City
3. An event held by the Association México Japan
4. A Japanese international disaster relief team engages in rescue activities after an earthquake that occurred in central Mexico in September 2017.



Various attached courses

In addition to the regular course and the preparatory course designed for students planning to enter the regular course, Sapporo Agricultural College had courses of various grades and fields required in Hokkaido in those days. Such courses included an agriculture training course to teach farming techniques to settlers, an agriculture course that was equivalent to secondary school, a military science course to foster tondehei (farmer-soldiers) and forestry and civil engineering courses for junior high school graduates. When Sapporo Agricultural College was reorganized as the College of Agriculture of Tohoku Imperial University in 1907, those attached courses were also reorganized as courses to provide vocational education.

Grades of the Specialist School of Business

In prewar days, the most standard way to complete university education was to take the route of studying six years in elementary school and five years in junior high school, then studying a foreign language and basic subjects for three years (ages 18 to 20) in high school and finally studying special fields for three years (ages 21 to 23) at university. In the case of the College of Agriculture of Tohoku Imperial University, students entered a preparatory course (equivalent to high school) before advancing to the College of Agriculture (equivalent to the faculty of agriculture). In addition to the preparatory course and the college, the College of Agriculture of Tohoku Imperial University had four attached courses: the practical course of agriculture, the practical course of forestry (renamed from the forestry course), the civil engineering course and the fisheries course. All were positioned as specialist schools of business under the prewar education system. The grades of the specialist schools of business were equivalent to high school and preparatory courses and were institutions of higher education where students aged 18 to 20 studied for three years and acquired professional business skills. In contrast to universities that focused on the learning of

professional knowledge in foreign languages, specialist schools of business emphasized the acquisition of expertise and skills. Those schools were also equivalent to colleges under the postwar educational system. In 1912, the College of Agriculture at Tohoku Imperial University had 206 college students, 283 students in the preparatory course, 85 in the practical course of agriculture, 79 in the practical course of forestry, 95 in the civil engineering course and 116 in the fisheries course. By grade, 24% were college students, 33% were high school students and 43% were students of specialist schools of business. The mixture of many students of different grades on campus was a feature that was not seen at other imperial universities.

Fisheries science at Sapporo Agricultural College

Of the courses in the specialist schools of business, the fisheries course stands out. It reflects the geopolitical environment of Hokkaido, which is surrounded by the sea and has the utilization of marine resources as an important challenge.

The School of Fishery shall be established in this college to foster develop and improve fishery.
The educational organization of the college shall be expanded as
“Statement on the expansion of Sapporo Agricultural College” by President

Sapporo Agricultural College emphasized fisheries. In the College's early days, Professor J.C. Cutter, who taught physiology, included marine organisms in his lectures on zoology. Kazutaka Ito, who was a member of the inaugural class and attended Cutter's lectures, later led the Hokkaido fisheries industry as the head of the Fisheries Division of the Hokkaido Government. Kanzo Uchimura, who was a year junior to Ito, gave a graduation speech entitled “Fishery is also an academic field.” After graduation, he engaged in fisheries surveys and tests, and created the List of Fish of Japan. Sapporo Agricultural College added fisheries science to the college lecture subjects in 1891, and Professor Shosuke Sato, who

specialized in agricultural economics, took charge of teaching the subject. At a teachers' meeting in 1893, Professors Kingo Miyabe, Inazo Nitobe and Takajiro Minami proposed adding the School of Fishery to the specialty fields for college students. In a statement on the expansion of Sapporo Agricultural College that President Sato submitted to the Ministry of Education in 1898, he made an appeal for the establishment of a school of fishery to teach about fish catching, fishing gear and fishery production.

Establishment of the School of Fishery

The School of Fishery was established in April 1907, immediately before Sapporo Agricultural College was elevated to the status of university. Tsunenobu Fujita studied in the College of Science of the Imperial University of Tokyo (presently the School of Science of the University of Tokyo) after being in the eighth graduating class of Sapporo Agricultural College. He worked as an engineer for the fisheries training institute of the Ministry of Agriculture and Commerce (presently the Tokyo University

fishery operators in Northern seas and to further
part of the promotion of business in Hokkaido.
Shosuke Sato of Sapporo Agricultural College)

of Marine Science and Technology). He became the director of the School of Fishery. The main teachers included Mr. Fujita, who was in charge of aquaculture science, Shunjiro Nozawa (in the fifth graduating class of Sapporo Agricultural College), who taught reorganized fisheries science, Kichisaburo Endo (from the College of Science, Imperial University of Tokyo), who taught hydrophytology, and Shigeo Sasa (in the 16th graduating class) and Yasushi Suzuki (in the 22nd graduating class), who taught fisheries production. The fishery classroom, training room, laboratory and other facilities were built on the Sapporo campus, the Oshoro Marine Biological Station was established near Otaru and the Oshoro-maru training ship was

built. In those days, the only other institute of higher education specializing in fisheries science was the fisheries training institute of the Ministry of Agriculture and Commerce. The School of Fishery was later reorganized as the School of Fishery of Hokkaido Imperial University, the Hakodate College of Fisheries, and in 1949, as the College of Fisheries, Hokkaido University. At present, there are only a few other institutes of higher education with independent fishery departments, including Tokyo University of Marine Science and Technology, Nagasaki University, Kagoshima University, Kitasato University, Tokai University, and the National Fisheries University, the last of which was under the jurisdiction of the Fisheries Agency. Fishery can be regarded as a field that has distinguished Hokkaido University's research and education for 140 years.



| | | |
|-----------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| January | 1880 | Professor J. C. Cutter gives lectures on marine organisms. |
| June | 1881 | Kanzo Uchimura of the second graduating class gives a speech entitled “Fishery is also an academic field” at the graduation ceremony. |
| October | 1891 | The curriculum of the college is revised to include fisheries science. |
| February | 1893 | Professors Miyabe, Nitobe and Minami propose at a teachers' meeting that the School of Fishery be established as a specialty field. |
| September | 1894 | Professor Shosuke Sato gives lectures on fisheries science. |
| January | 1898 | President Shosuke Sato submits to the deputy minister of education a statement on the expansion of Sapporo Agricultural College that makes an appeal for the establishment of a school of fishery. |
| December | 1905 | A decision is made to establish the School of Fishery. |
| December | 1906 | A new Fisheries Course classroom is built. |
| April | 1907 | The Sapporo Agricultural College School of Fishery is established. |
| September | 1907 | Sapporo Agricultural College is reorganized as the College of Agriculture, Tohoku Imperial University. |
| October | 1907 | The Fisheries Chemistry Laboratory is built. |
| November | 1907 | The Oshoro Marine Biological Station is built. |
| March | 1908 | The Fisheries Training Room is built. |
| February | 1909 | The Oshoro-maru training ship is built. |

Hokkaido University Archives
This facility collects, classifies and preserves historical documents and records of Hokkaido University. It also conducts investigations and research on its history.

A comprehensive partnership agreement concluded with the Hokkaido Branch of the Yomiuri Shimbun

On March 1, 2021, Hokkaido University and the Hokkaido Branch of the Yomiuri Shimbun concluded a comprehensive partnership to promote social contribution activities through mutual cooperation.

Various collaborative activities have been conducted with the Hokkaido Branch of the Yomiuri Shimbun, including the Science Lecture event to convey the fun of science to elementary and junior high school children. With the conclusion of the partnership, activities to contribute to the advancement of the university's education and better lives in local communities will be further promoted.

President Mitsuaki Inaba and Vice President Seiji Hasegawa of the Hokkaido Branch of the Yomiuri Shimbun and President Kiyohiro Houkin and Director/Vice President Hiroshi Yoshimi of Hokkaido University attended the conclusion ceremony, and President Inaba and President Houkin each expressed their wishes for the future.

The parties will establish a collaboration council to maintain close partnership and cooperation with each other, and ensure smooth promotion of measures to contribute to the development of Hokkaido.



The group photo of the final screening for the EAEVE

nano tech 2021: We presents research seeds for the first time

The first time that the Institute for the Promotion of Business-Regional Collaboration ever made a presentation was at nano tech 2021, held at Tokyo Big Sight from December 9 to 11, 2020.

Almost half of the visitors to nano tech 2021 were R&D-related people. This exhibition is ideal for opening up new markets and finding partners for new projects.

We exhibited six nanotech-related research seeds. Due to the pandemic, the 10,615 attendees made up

only about a quarter of last year's attendance. Even so, about 70 people visited the university's booth and consultations were given on joint research and other topics.

The Institute for the Promotion of Business-Regional Collaboration will continue to promote industry-university collaborative activities while planning various matching projects with private companies and other organizations.



The Hokkaido University booth



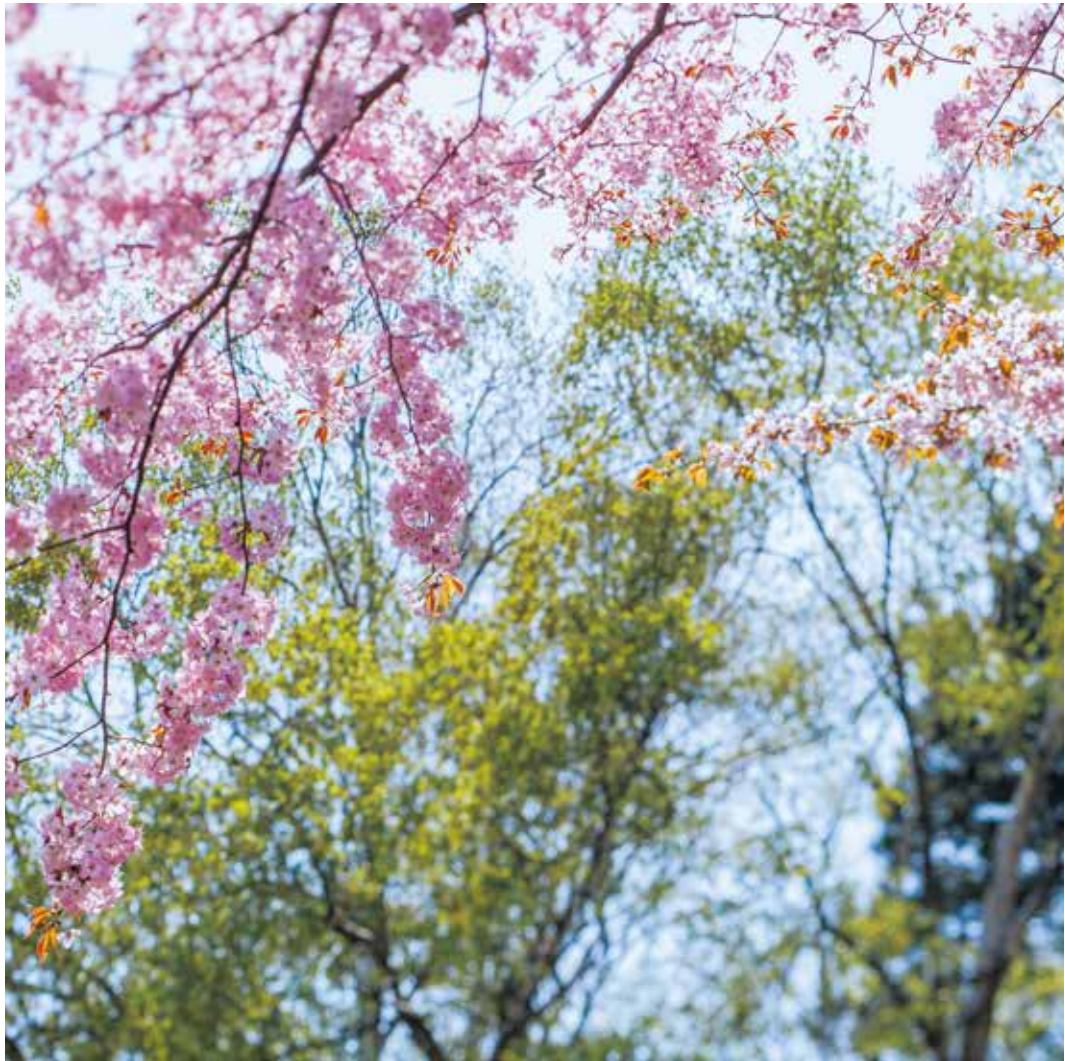
Professor Hasegawa (right) gives explanations to visitors.

Exhibition content (research themes/researchers)

1. A light wavelength conversion film: for higher efficiency of solar cells, Faculty of Engineering
Professor Yasuchika Hasegawa
2. A photoacoustic imaging agent that enables the observation of abnormalities in the body using color variations, Faculty of Pharmaceutical Sciences
Professor Mikako Ogawa
3. A small fluorescent mutual correlation detection system, Faculty of Advanced Life Science
Professor Masataka Kinjo
4. A full-spectrum visible light photocatalyst using strong coupling, Research Institute for Electronic Science
Specially Appointed Professor Hiroaki Misawa
5. The identification of nano materials by electronic trap density analysis, Institute for Catalysis
Professor Bunsho Otani
6. The development of high-speed measurement and diagnostic equipment, Research Institute for Electronic Science
Professor Tamiki Komatsuzaki

The campus shows signs of spring.

Photographer: Akihito Yamamoto



a



b



c



d



e

Winter has ended, and pleasant spring breezes blow.

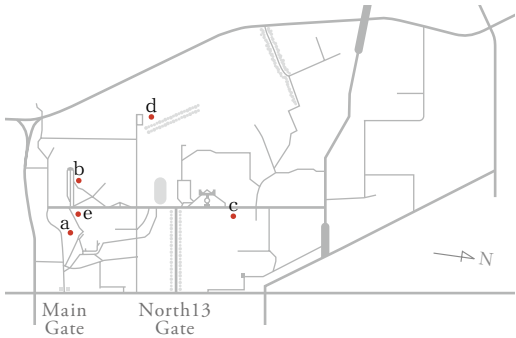
This pandemic year was unlike any other year. Although education and research activities are limited at the university, students and faculty members have adapted to the changed environment and a “new normal” seems to have taken hold.

The seasons change quickly. Soon cherry blossoms will bloom and fresh greenery will spread on campus.

Note: For videos showcasing the natural splendor of the campus in different seasons, please visit the University website.



Videos of
campus views
QR code



- a. Central Lawn
- b. Former School of Agriculture Library
- c. School of Medicine
- d. Poplar Avenue
- e. Furukawa Hall

