Hokkaido University E-Newsletter

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Hokkaido University Times

Yoshizawa Kazunori awarded the Ig Nobel Prize

Associate Professor Yoshizawa Kazunori of the Graduate School of Agriculture won the 2017 Ig Nobel Prize in Biology with three other researchers, Rodrigo Ferreira, Yoshitaka Kamimura, and Charles Lienhard, for their discovery of "a female penis and a male vagina in a cave insect."

The Ig Nobel Prize, commonly seen as a parody of the Nobel Prize, honors achievements that "first make people laugh and then make them think." Winners are announced every autumn and the award ceremony, attended by Nobel laureates, takes place at Harvard University. This year's ceremony was held on September 14th and broadcasted live online.

Yoshizawa and his collaborators reported the discovery of a female penis and male vagina in Brazilian cave insect genus Neotrogla in Current Biology in 2014, undermining the common assumption that a penis is a male organ and a vagina a female organ. In the paper, the authors write "The correlated genital evolution in Neotrogla is probably driven by reversed sexual selection with females competing for seminal gifts. Nothing similar is known among sex-role reversed animals."

Although none of the four winners could attend the ceremony at Harvard since they were in the middle of a cave exploration in Japan, they sent a video acceptance speech saying "Our discovery made billions of dictionaries outdated." One of the researchers explained "I peeped their sex life every 30 minutes and found that a female anchors a male by using her spiny penis for up to 70 hours."

Japanese researchers have won the award for eleven consecutive years, including Professor Toshiyuki Nakagaki of Hokkaido University, who won in 2008 and 2010 for his research on amoeboid organisms.

Photo by Ig® Nobel, Improbable Research

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Cover photo:
Poplar Avenue on Sapporo Campus.
Taken by the Editor (see p.10)

Hokkaido Summer Institute Wrap-up! Read about the courses!

Regional Development and Natural Resources in Cold Climate

Hokkaido is known for its snow, whether that be its quality, quantity or the many snow and ice related festivities that are held throughout the prefecture. The Hokkaido Summer Institute's course taught by lecturers from Japan and Finland, "Regional Development and Natural Resources in Cold Climate," is thus set against the backdrop of this ideal setting.

Living in a cold climate causes many challenges related to snow and ice. The main aim of the course is thus to investigate the ways in which people in cold climates can utilize their natural settings to their advantage and draw tourists to these areas. Topics include how to safely construct and creatively design landscapes and attractions using snow and ice. "I hope they [the students] can see snow and ice as potential materials for new types of winter architecture, and realize snow and ice create possibilities from an artistic point of view," elaborated Antti-Jussi Yliharju from the University of Lapland.

In addition to attending lectures, students work in groups to develop their own winter event on campus. "We want students to understand snow and ice as a resource for people to make something new in cities," explained Kai Ryynanen from Lapland University of Applied Sciences. To get in the right frame of mind, the course includes a field trip component exploring some of the main attractions within the university. The following day, the groups plan what their event would be, where it would be held, who the intended audience is, and, in as much as detail possible, how it could be practically prepared for and executed.

This year's course was attended by students all over the world from different disciplines. When asked about this diversity, Professor Timo Jokela from the University of Lapland answered: "The ecosystem gives us resources, but how do we exploit them? We cannot solve this through one discipline. We all share these challenges, so I hope there will be many more collaborations between multiple disciplines and countries."

The interaction between snow-and-ice enthusiasts was very much apparent this summer. When asked why she took the course, one of the students, Essi Oikarinen from the University of Oulu, happily exclaimed "It's very much related to my thesis topic, and I also wanted to come see Japan. It's my first time in Japan, but hopefully not my last!"

Snow and ice have the potential to bring people together and make the season more enjoyable. This course highlights the strengths of these resources and explores how we can work together to utilize them.

Pacific Music Festival 2017 - Art, Politics and Economy

"What's your most memorable musical experience?"

Professor Mari Yoshihara from the University of Hawai'i at Manoa asked students this question at the beginning of the lecture. It was an icebreaker that elicited a lot of responses. Some students talked about their memories of playing music while some others spoke about listening to music. "Music was my mental connection to my home country," said a Japanese student who once studied as an exchange student in Singapore.

As part of the Hokkaido Summer Institute 2017, "Seminar in History and Anthropology. Pacific Music Festival 2017: Art, Politics, and Economy" tied in the Pacific Music Festival (PMF), an international educational music festival held annually in Sapporo, and connections with the Ainu, the indigenous people in Hokkaido, as case studies. The course was held from July 18th to 25th to give students an introduction to cultural studies. Fifteen students including ten from overseas participated in the program.

In the lecture, Mari Yoshihara introduced the concept of "Musicking" which consists of any activity and experience in its entirety related to music. She also discussed musicology, historical approaches and anthropological approaches to studying music. The roles of music in colonialism and international politics were also highlighted. In a collaborative session with the PMF, Yoshihara interviewed Maestro Jun Markl to show how to understand people and their cultural background in a process called ethnography. The students then interviewed the PMF Academy students to put it into practice.

Meng Cao, a student from Nankai University in China, said "I like music from my childhood and wanted to gain a deeper understanding of it. I'm impressed by the professors who make each session so interactive and engaging. I'm really enjoying it."

Professor Yujin Yaguchi from the University of Tokyo introduced the history of Hokkaido and the Ainu. He stressed the importance of looking at a subject from different angles and other people's points of view, such as the Ainu's. He also shed light on complex issues related to cultural heritage and tourism. They later visited the Ainu Museum "Poroto Kotan" in Shiraoi to get firsthand experience of Ainu culture.

Professor Eijun Senaha of Hokkaido University's Graduate School of Letters, who organized the course, says "With the help of Dr. Yaguchi and Dr. Yoshihara who are both front runners in their respective fields, our course intends to put local subjects in a global context. I want students to be capable of seeing multiple aspects of one subject. I also hope they acknowledge these two professors as role models."

Article by the Division of International Students, International Affairs

ISP Integrated Science Program

MJSP HOKKAIDO UNIVERSITY'S Modern Japanese Studies Program

Our bilingual undergraduate program, the Modern Japanese Studies Program (MJSP) and English-taught undergraduate-graduate program, the Integrated Science Program (ISP) are pleased to announce that the online applications are going to open during the following dates:

MJSP online application periods
First call: 1 November, 2017 – 27 November, 2017
Second call: 1 February, 2018 – 26 February, 2018

ISP Online application period (for undergraduate admission)
13 November, 2017 –18 December, 2017

All the latest information on admissions is available at the following websites.

- MJSP website (https://www.oia.hokudai.ac.jp/mjsp/)
- ISP website (https://www.oia.hokudai.ac.jp/isp/)

If you have any questions or concerns, please do not hesitate to contact us at isp@oia.hokudai.ac.jp or mjsp@oia.hokudai.ac.jp.

Nobel Prize laureate lectures high school students

Hokkaido University Emeritus Professor Akira Suzuki, a Nobel Prize laureate, gave a lecture to Chinese high school students on July 25th, 2017. The students visited Hokkaido University as a part of the "Sakura Science High School Program" sponsored by the Japan Science and Technology Agency.

The "Sakura Science High School Program" invites excellent high school students from Asian countries and provides opportunities for them to see Japan's state-of-the-art technology and to interact with outstanding scientists. This time, 35 Chinese students and 7 teachers visited the university. In addition, 25 students attended the lecture from Sapporo Kaisei Secondary School which is designated as a Super Global High School.

Emeritus Professor Suzuki spoke on his Nobel Prize award winning research on the "Suzuki Coupling Reaction" and its wide range of applications in a lecture titled "An Example of Useful Science: Organic Synthesis by Organoboron Coupling Reaction." He also presented photographs of the Nobel Prize Ceremony. Specially Appointed Associate Professor Yasunori Yamamoto from the Faculty of Engineering chaired the event.

The students listened attentively to the lecture, which was followed by a Q&A session. Students asked about the future of science and the key to thinking of great ideas amongst other questions. These questions were welcomed and answered by the Professor Emeritus as he cheered on the future scientists.

(Left) The then MEXT Minister Mastuno riding a driverless tractor. (Right) Commemorative photo. Matsuno is fourth from the right next to President Nawa.

Now former MEXT Minister visits the university

On Wednesday, July 26th, the now former Minister of Education, Culture, Sports, Science, and Technology (MEXT), Hirokazu Matsuno, visited Hokkaido University to inspect the robots used for agricultural work, the Space Mission Center at the Creative Research Institution (CRIS), and the Global Research Center for Food & Medical Innovation (FMI). He also spent the day discussing how to advance research and education with a number of university officials.

The day began at the Administration Building with Matsuno being welcomed by President Nawa, who gave a general overview of the university. There, they and other university officials deliberated on the current state of higher education, research, and ties between industries and academic institutions.

Under the fine weather and refreshing summer air of Hokkaido, Matsuno then visited the agricultural fields on campus. While receiving an explanation by Professor Noboru Noguchi from the Research Faculty of Agriculture, he was able to inspect some agricultural robots (driverless tractors), remote control them via a tablet, and watch them to go through the farm roads into some fields. This system allowing coordinated operations between multiple robots is the product of the Cabinet Office's Cross-ministerial Strategic Innovation Promotion Program. Matsuno took this opportunity to ride on one of the self-moving tractors, showing great interest in how they worked together in the fields. "This is a great experience. I hope this will encourage young people to become more interested in agriculture," he remarked.

After wrapping up at the fields, Matsuno was then taken to CRIS, where Professor Yukihiro Takahashi of the Faculty of Science spoke to him about the undergoing information revolution based on the appearance of microsatellites. Recently, microsatellites have been replacing larger ones, and they are expected to be further utilized to study global warming and predict natural disasters. Looking at the vacuum chamber utilized during the development of these satellites and the cleanroom used to build them, Matsuno asked about applications for field-based scientific research and collaboration goals between the university and industries.

Matsuno then visited the FMI where research collaborations have been progressing between the university, local government, and businesses to create an active and healthy society for all ages. The FMI provides companies with laboratory spaces with which they can work with academic researchers. With the day coming to an end, Matsuno inspected the joint-use facilities and the "future room" at the FMI. The latter is designed so that people can sit in a circle and have a casual round table discussion.

Article by Esma E. Onay — Hult Prize Campus Director at Hokkaido University

Hult Prize @ Hokkaido University

Hokkaido University Sustainability Weeks

HULT PRIZE @ HOKKAIDO UNIVERSITY

Join the New Wave of Social Entrepreneurs

Program Outline

October 2017
- Information and Networking Sessions
- Team registrations

November 2017
- Start Hult Prize @ HU
- Five-week Workshop and Training Series
- Special event

December 2017
- Hult Prize @ HU Semifinals
- Hult Prize @ HU Finals

March 2018
- Winning Team advances to the Regional Finals all around the world

Summer 2018
- Top selected teams attend the Global Accelerator at the Hult Castle

September 2018
- Hult Prize Global Finals

What is the Hult Prize?

Hult Prize is the world's largest student competition for social good, in which teams of top universities from all over the world will create social start-ups that will tackle the world's most pressing issues. Hokkaido University's winning team will proceed to the Regional Finals, ultimately competing for the $1,000,000 Start-up Prize!

Revolving around entrepreneurship, leadership, and cultural exchange for the 2018 Challenge on Energy, Hult Prize at Hokkaido University will launch an extensive training and workshop program for its participants. If you have the desire to solve the world's most pressing issues, and if you wish to make an impact on the world with your $1,000,000 idea, then you might be the next Top Social Entrepreneur in 2018!

Who can compete for the Hult Prize?

The Hult Prize @ HU competition is open for all talented and motivated undergraduate, graduate, and PhD students of Hokkaido University.

Where can I find information?

Email us for questions at hultprizehokkaido@gmail.com, visit hultprizeat.com/hokkaido for details, and follow @hultprizehu on social media.

Oshoro Maru returns from 58-day voyage to Arctic region

Oshoro Maru, a training ship belonging to Hokkaido University's School of Fisheries Sciences, has come back from a 58-day journey to the Arctic region via the Bering Sea to conduct oceanographic and ecological research while training undergraduate students from several Japanese universities.

It was the first overseas voyage for the current, fifth-generation Oshoro Maru V—which was commissioned in July 2014—and the first in four years for an Oshoro Maru ship. Oshoro Maru IV sailed to the Arctic region in 2013 before being decommissioned.

Oshoro Maru V left Hakodate Port on June 5th and made port calls at Tokyo, Dutch Harbor and Nome (both in Alaska) before returning to Hakodate on August 1st. Aboard the ship were Hokkaido University students taking an at-sea training course, and students from other universities under a Ministry of Education, Culture, Sports, Science and Technology (MEXT) arrangement that allows them to enroll in courses offered by other institutions. The students were joined by researchers from Hokkaido University and elsewhere who are participating in the Ministry's Arctic Challenge for Sustainability (ArCS) Project.

Due to global warming, temperatures in the Arctic region are estimated to have risen more sharply than in many other regions, resulting in the rapid melting of sea ice in the Arctic Ocean. Researchers on the Oshoro Maru IV in the International Polar Year (2007-08) and in 2013 found massive volumes of warm seawater from the Pacific flowing into the Arctic Ocean causing the amount of sea ice to decline. That triggered changes in the distribution of plankton and the ocean's primary productivity, specifically the amount of carbon fixed by marine phytoplankton absorbing carbon dioxide in the seawater.

The Arctic ice has decreased further in the four years since the 2013 Oshoro Maru expedition. It is feared that the sea ice will melt completely during the summer in the future, which will have a major impact on the region's marine ecology. There are also concerns that pollutants from lower-latitude regions could accumulate in high concentrations in creatures of the Arctic region at the end of the food chain.

If the sustainable use of marine resources is to be ensured and biodiversity preserved, it is, therefore, an urgent task for countries in the vicinity of the Arctic Ocean and the entire international community to unravel the mysteries over such climate change-linked phenomena. This is especially considering the northward shift in the distribution of living organisms and changes in their feeding behavior.

During the voyage, the researchers collected scientific data to shed light on the impacts of global warming and human activity on biodiversity in the Arctic region, as well as the mysteries of the Arctic biota and the region's ecological structure and functions.

Photographs and videos were taken to inform middle and high school students about the wonders of the ocean and stimulate their intellectual curiosity about the sea. This undertaking was made possible by a grant from the Nippon Foundation's Sea and Japan Project.

Oshoro Maru V, an ice-class ship designed to withstand the harsh conditions of subarctic and arctic zones, is an educational and research platform for fisheries and other related sciences. It was commissioned to facilitate exchanges and joint research between academic and research institutions in Japan and abroad, and to contribute to the reconstruction of the fisheries industry in the Tohoku region, which was devastated by the 2011 Great East Japan Earthquake.

New therapeutic antibody for dog cancers

Scientists have developed a new chimeric antibody that suppresses malignant cancers in dogs, showing promise for safe and effective treatment of intractable cancers.

Similar to our aging society, dogs live longer than before and an increasing number of them die from cancer nowadays. As seen in humans, dogs have malignant cancers that cannot be treated by existing therapies such as surgery, radiotherapy and chemotherapy. Oral malignant melanoma (OMM), a highly invasive cancer in dogs, is one such example.

In humans, some malignant cancer cells express PD-L1 proteins that bind to their receptor PD-1 on T cells, resulting in the suppression of the T cell's immune function. Thus, PD-L1/PD-1 interaction is considered an "immune escape mechanism" that cancer cells have. Antibodies that block PD-1/PD-L1 binding have proven effective in inducing anti-tumor immune responses and have been widely used in immunotherapy in the last five years. However, in dogs, no such clinical studies have been reported so far.

Professor Satoru Konnai of Hokkaido University and his collaborators in Japan have developed a chimeric anti-PD-L1 antibody that induces immune responses and therefore tumor regression in dogs with malignant cancers.

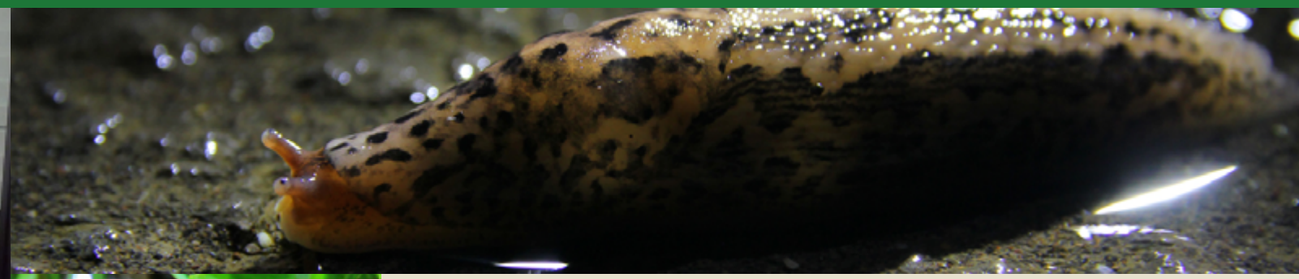
The team first revealed that PD-L1 is expressed in the cells of OMM and another type of cancer called undifferentiated sarcoma, confirming that those two cancers are likely targeted by the immunotherapy. They then utilized a rat anti-PD-L1 antibody to develop a rat-dog chimeric antibody which should help avoid rejection by the immune system and allergic reactions when administered to dogs.

In their pilot clinical study, seven dogs with OMM and two dogs with undifferentiated sarcoma were treated with the chimeric antibody every two weeks. One of the OMM dogs showed obvious tumor regression after ten weeks of administration while one dog with undifferentiated sarcoma showed a significant decrease in tumor burden after three weeks. None of them showed adverse effects such as an allergic reaction. Moreover, their data suggested the treatment may have prolonged survival in dogs with OMM after pulmonary metastasis.

"Chimerization of the antibody is now proven as a simple and effective strategy to develop therapeutic antibodies in veterinary medicine. Although further clinical studies are needed, other PD-L1-positive cancers could be targeted by the antibody we have developed," says Satoru Konnai. "Given the similarity between humans and dogs in cancer biology, our study should provide a beneficial model for human preclinical studies."

Original Article:
Maekawa N. et al., A canine chimeric monoclonal antibody targeting PD-L1 and its clinical efficacy in canine oral malignant melanoma or undifferentiated sarcoma. Scientific Reports, August 21, 2017.

Funding information:
This work was supported by a Grant-in-Aid for Scientific Research (16K15042) and Grant-in-aid for JSPS Fellows (15J01989) from the Japan Society for the Promotion of Science (JSPS), and the Platform for Drug Discovery, Informatics, and Structural Life Science (Proposal No. 2157) from the Japan Agency for Medical Research and Development (AMED).



Photos by Ryusei Yamakami (top, top-left) and Ayumi Kikuchi (bottom-left)

Native leech preys on invasive slug?

Citizen science has revealed the spread of the invasive giant slug Limax maximus and its potential native predator in Japan, providing new insights into predator-prey dynamics between introduced prey and native predators.

The giant slug Limax maximus is native to Europe and Asia Minor but has spread widely, being found in North America, South America, North Africa, South Africa, Australia, New Zealand and other regions. The slug is recognized as a notorious pest because it eats agricultural and garden crops.

In Japan, L. maximus was first found in Ibaraki Prefecture in 2006 and its population has rapidly spread throughout the country, making it difficult for scientists and local governments to monitor the slug's occurrence and behavior.

Yuta Morii of Hokkaido University and Takafumi Nakano of Hiroshima University investigated the habitat range of L. maximus in Hokkaido, Japan, by recruiting ordinary citizens as "citizen scientists" through a local newspaper and a television program.

A total of 38 observations were reported by the citizen scientists from February 8 to October 18 in 2016, including 29 reports accompanied by a photograph, the exact location and the date of the observation. The team analyzed these 29 records along with previously published records about the species.

At least 16 naturalized populations of L. maximus were found in Hokkaido, 14 of which were previously unknown. Four sites were more than 30 kilometers from Sapporo, where the species was first detected in 2012, and were distant from each other.

Notably, one observer submitted a photo of an L. maximus individual being preyed on by a microphagous leech, Orobdella kawakatsuorum. Orobdella leeches are known to inhabit Japan and adjacent regions, and were thought to feed on only earthworms, not slugs. "It was a surprise to see this specialist predator might have changed its prey to include the newly appeared resource," says Morii.

"Citizen science has proven to be a powerful tool for revealing the spread of recently introduced species, and could even provide significant data to better understand predator-prey dynamics. This study also revealed that L. maximus feeds on cucumber, sweet potato, lettuce and Chinese cabbage, which emphasizes the importance of controlling their populations," Morii said.

Original Article:
Yuta Morii and Takafumi Nakano, Citizen science reveals the present range and a potential native predator of the invasive slug Limax maximus Linnaeus, 1758 in Hokkaido, Japan. BioInvasions Records, July 17, 2017.

Event Photos

The 17th Sci-Tech Talk in English by Cawthron Nelson Institute and the University of Auckland. Photo by OIAS.

Beer Garden on the Green 2017
Image by Hokkaido University PR.

2017 Hokkaido University Marche

President Nawa receives Honorary Doctorate Degree from Chungbuk National University

The 3rd South Africa-Japan University Forum

President Nawa attends the Times Higher Education Summit as a panelist

Inter-University Exchange Agreement with United Arab Emireates University

Sakura Science Program Visit.
Image by the Integrated Science Program.

GiFT participant takes the 2017 Hokkaido University Experience Tour

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https://www.global.hokudai.ac.jp/

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