Hokkaido University Times

Hokkaido University's E-Newsletter

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Cover photo:
Lupine flowers on campus

Hokkaido University Ranks within Top 100 Universities Worldwide

Results from the Nature Index, a database that tracks contributions to articles published in a group of highly selective science journals, rank Hokkaido University as the Top 100 academic institution in the world, and the Top 8 in Japan this year. The Top Global and Top Japan spot were awarded to Harvard University (Massachusetts, USA) and the University of Tokyo (Tokyo, Japan), respectively.

Rankings were calculated based on a weighted "fractional count", or "WFC" score, which assigns tallies to each institution based on the number of contributing researchers from an institution to the published paper. The database also collects data on the total number of articles published by each institution during the recorded year; for the year March 2017–February 2018, the Nature Index totaled 223 articles published exclusively by or in collaboration with Hokkaido University researchers in the eligible journals. The database is compiled by Nature Publishing Group (NPG) and the journals are selected for consideration by two panels of scientists representing the physical and life sciences, and include globally recognized publications such as *Science*, *Nature*, and various nationally sponsored research journals.

Visit the Hokkaido University Nature Index page for more information: https://www.natureindex.com/institution-outputs/japan/hokkaido-university/5139072d34d6b65e6a002178

Ambassador and Partner Activities

Appointment of Ms. Outi Snellman as Hokkaido University Ambassador

The university has been appointing Hokkaido University Ambassadors and Partners to those who support and strengthen the university's global network, community and international public relations activities since April 2016. To date, 31 Ambassadors and 126 Partners have been appointed from 34 countries.

On Wednesday, June 6, the Hokkaido University Ambassador Appointment Ceremony was held for Finnish Hokkaido University Ambassador Ms. Outi Snellman.

Ms. Outi Snellman has been of great assistance in promoting collaborations between Hokkaido University and the University of Lapland. She was primary responsible for the opening of a joint symposium between Hokkaido University and Finnish Universities, the University of Lapland and University of Oulu, and established the program accepting students for Hokkaido University's First Step Program, amongst other activities as Vice-President Organization at the University of the Arctic and Director of the University of Lapland. The University of Lapland has a long history of exchanges with Hokkaido University, having signed an Inter-University Exchange Agreement on June 2011.

The appointment of Ms. Snellman as Hokkaido University Ambassador will help further the development of international research collaborations with the University of the Arctic and University of Lapland, expand the Learning Satellite Program and Hokkaido Summer Institute, and promote educational and research exchanges between the more than 200 universities associated with the University of the Arctic.

Ms. Outi Snellman and Prof. Masanori Kasahara, Executive Director and Vice President of Hokkaido University

Commemorative photo

Hokkaido University hosts delegation of Russian university rectors and students for the General Assembly Meeting and Student Forum

The 1st General Assembly Meeting of the Association of Institutions of Higher Education of the Russian Federation and Japan took place over the weekend of May 19th and 20th. The events were held as a part of the Human Resource Development Platform for Japan – Russia Economic Cooperation and Personnel Exchange (HaRP) at both the Conference Hall of Hokkaido University and Keio Plaza Hotel Sapporo.

About 200 people paritcipated in the General Assembly Meeting. This included presidents and vice presidents from 21 Japanese and 11 Russian member universities, as well as non-member universities and business representatives with a strong interest in inter-university exchanges between the two countries.

The assembly opened with remarks from Hokkaido University President Toyoharu Nawa, who acted as representative of one of the organizing universities and co-chair of the meeting. Following President Nawa's opening statements, assembly members heard brief speeches from guests of honor Mr. Yoshimasa Hayashi, Minister of Education, Culture, Sports, Science and Technology (MEXT), Mr. Manabu Horii, Parliamentary Vice-Minister of Foreign Affairs, Ms. Harumi Takahashi, Governor of Hokkaido Prefecture, and Mr. Andrey Fabrichnikov, Consul-General of the Consulate-General of the Russian Federation in Sapporo. Following the opening ceremony, faculty members of Hokkaido University delivered lectures to the attendees following the General Assembly Meeting theme of the "Promotion of Human Resource Development for Japanese–Russian Economic Cooperation and Personal Exchange."

The following day, Prof. Victor Sadovnichy, Rector of Lomonosov Moscow State University, gave a keynote speech about the history of the Japanese–Russian Forum of Rectors and the Russian Rector's Union. Prof. Kiyoshi Yamada, President of Tokai University, also gave a keynote speech about strengthening inter-academic exchanges with Russian universities.

After the speeches, three parallel sessions under the subtopics "Personnel Exchanges," "Health and Medicine," and "Regional Development" were held as well as the HU–MSU Round Table "Russian – Japanese Cultural Dialogue." In each parallel session, exchange plans were introduced by each university and there were active discussions concerning the promotion of future inter-university exchanges. President Nawa and Rector Sadovnichy agreed upon a shared vision of a new era in Japan–Russia inter-university exchanges, and promised that both universities would lead the future of these exchanges together.

In the last part of the General Assembly Meeting, a communique was created based on the outcomes of the parallel sessions and the Japan–Russia Student Forum discussions. The results of these discussions included the establishment of the Committee for Personnel Exchanges between Japan and Russia, the Japan–Russia Student Union, and the Steering Committee for Specialized Sections. In addition, both sides agreed to promote transdisciplinary exchanges among young researchers, interdisciplinary research, and industry–academia collaborations. Finally, Moscow State University was confirmed as the host of the 2nd General Assembly meeting, to be held next year. President Nawa and Rector Sadovnichy approved all points presented in the communique in the official Signing Ceremony before members of the Assembly.

Coinciding with the General Assembly, the Japan–Russia Student Forum was held on May 18th and 19th in the Conference Hall of Hokkaido University. The purpose of the forum was to build mutual understanding and friendly relations through student exchanges. 34 students in total from Japan and Russia participated in the forum and earnestly discussed the proposed Japan–Russia exchanges for many hours. During the General Assembly Meeting on the 19th, student representatives from Japan and Russia presented the outcome of their discussions to General Assembly participants MEXT Minister Yoshimasa Hayashi and Russian Consul Roman Kolesnik. The students proposed the establishment of the Student Union, which was agreed upon and praised by both the Minister and Consul.

Finally, Rector Sadovnichy was awarded an honorary degree from Hokkaido University on May 19th to honor his achievements for contributions to personnel and academic exchanges between both countries, his exchanges with Hokkaido University, and for his assistance in the establishment of the Association as well as the implementation of the General Assembly.

Photo captions:

P. 4: President Nawa and Rector Sadovnichy of Lomonosov Moscow State University holding the communique

P.5 top: General Assembly Meeting commerative photo

P.5 bottom: Mr. Yoshimasa Hayashi, Minister of Education, Culture, Sports, Science and Technology and President Nawa talking with student representatives from the Japan–Russia Student Forum

Spotlight on Research

Boxing, Evictions and Poverty in the Philippines

Dr. Tomonori Ishioka (right) with Alex Escaner, one of his boxer friends in the Philippines

"For a single event, there are many stories, many realities," explained Associate Professor Tomonori Ishioka. "As a sociologist of the body and urban poor, it is my obligation to use theory to understand events and share to everyone the realities of the people who live at the social bottom—to share their history."

For a large portion of his academic career, Dr. Ishioka has focused on the relationship between boxing in the Philippines and poverty. To thoroughly study this, he emphasizes the importance of taking ethnographic research further to include live-in research, physically experiencing and participating in boxers' daily lives to understand their lives and perspectives

"'Live-in' is a key word in my research. The boxing gym is a window to observe slum and shanty town life."

He would go on morning jogs, eat breakfast, train, socialize, have dinner and sleep in the same quarters as the boxers in a gym located in Paranaque, Manila.

According to Dr. Ishioka, boxers usually have strong connections with shanty towns, and this is especially apparent after they retire. Facing the dilemma whether or not to stay in Manila because of the opportunities the city presents, retired boxers often end-up living in the city slums due to financial difficulties and poor educational background. They take up seasonal work in construction or become pedicab drivers. Even boxing managers take up side jobs, running a cock-fighting business or a nearby restaurant for example.

About a decade ago, the capital of the Philippines, Manila, began experiencing rapid globalization and economic growth. The popularity of boxing in the country gave rise to new opportunities for retired boxers to become fitness trainers in gyms. "Boxing and fitness culture became the new fashion for the middle class." Dr. Ishioka explained.

However, this economic boom led to new problems for those in the slums. Shanty towns are mostly located within city centers, and with the international urbanization of the city, the Filipino government and National Housing Authority began issuing evictions to those living in shanty towns to be demolished and relocating these people outside of the city.

When these initiatives began in the 1960s and 70s, relocation sites were fairly close to the then city center of Manila and have by now been reintegrated into the city; but nowadays, those who face eviction are being sent to areas so far from Manila that it makes it impossible to commute to work on a daily basis. Because of the convenient location, but also more so because people do not want to leave their homes, demolitions tend to turn violent.

"In most cases, after relocation the husband moves to Manila. He lives with friends, or becomes 'weekday homeless,' meaning on weekdays he lives the homeless life—sleeps in jeepneys for example—and then he goes back to the relocation site on the weekends."

Dr. Ishioka (far left) enjoying life in the boxing gym

Dinner time with the boxers

Other than the discord this causes within families, this creates a number of social problems. Dr. Ishioka mentioned there is an increase in violence, and it is not uncommon for the men who work in Manila to spend their wages before the weekend on gambling, cock-fighting, and drinking. The women left at the relocation sites also turn to drugs and prostitution to earn money.

It is normal for extended families in the Philippines to live together, even the impoverished. The prospect of opportunity that cities offer draws people to move into the same household. On an economic level, these people live in poverty, but, on a social level, they have each other. They are able to confide in each other and build strong social networks. However, since relocation areas are located so far away from the city, this disappears. "Only loneliness, *malungkot* in Tagalog, and poverty are left." Dr. Ishioka remarked.

Manila is experiencing economic growth, and this is great for many people; but the development of the city has created new poverty. Dr. Ishioka claims that the number of homeless people is now actually higher than before, contrary to how the situation may look initially. However, every story can be seen through different lenses—from the social bottom, through to the middle class, all the way to the upper echelons of society.

Shanty town in Quezon City, post-demolition

"I would like to tell a story of my friend, a former boxer," Dr. Ishioka started. "He trained hard, had heart, and loved boxing, but boxing did not love him. So, he retired from boxing and became a fitness trainer in a shopping mall. If we think about this story with this information, we may think: 'Great! The redevelopment of Manila created new opportunities for retired boxers. The situation is good!' But after this, the homes of his relatives were demolished by the very same company he works for—There is no simple story."

Dr. Ishioka regularly visits the Philippines and continues researching urban marginalities, the urban poor, poverty, and boxing. His work on boxers was published in a book titled Everyday Life of Underdog Filipino Boxers: Body Cultures Crafted in Destitution. His current study on evictions and the demolition of shanty towns has led him to start studying the social effects of tear gas, a chemical used against those who refuse to leave to-be-demolished shanty towns. He expects to publish this research in the coming years.

Key molecule for flu infection identified

After decades of research, a research team has discovered the key receptor molecule that enhances the infection of the influenza A virus, providing a novel target for anti-flu drug development.

Professor Yusuke Ohba (center) and the lab members.

Viral infection starts when a virus particle attaches to a receptor molecule on the surface of a host cell. The virus particle then hijacks cellular machinery to enter the cell and replicate itself, establishing the infection. The key receptor molecule for the influenza A virus (IAV) has remained unidentified despite decades of research.

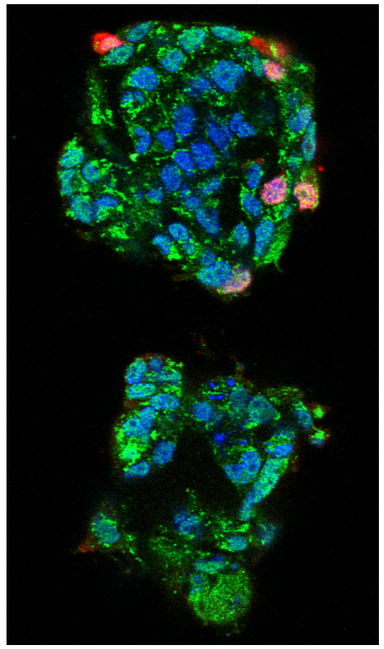
A research team led by Professor Yusuke Ohba of Hokkaido University previously demonstrated that changes in Ca^{2+} concentration in host cells play an important role in IAV infections.

In the latest study published in *Cell Host & Microbe*, the team has discovered that the Ca^{2+} channel, a transmembrane protein that allows Ca^{2+} to move across the cell membrane, is the key receptor molecule for IAV infections. Furthermore, treating human cells with calcium channel blockers (CCBs), which are commonly used as anti-hypertension drug, significantly suppressed IAV infections.

In experiments using cultured human cells, the team found that IAV binds to the Ca^{2+} channel on the cell's surface to trigger an influx of Ca^{2+}, followed by entry of the virus and infection. Knocking down Ca^{2+} channels inhibited IAV-induced Ca^{2+} influx and virus entry. They also revealed that sialic acid on the Ca^{2+} channel is crucial for the virus to bind.

Finally, the team tested the effect of CCB on IAV infections using mice. When they treated the animals with CCB intranasally, a significant and dose-dependent reduction in the amount of replicated viruses was observed. When the animals were treated with high amounts of IAV, administration of CCB significantly prolonged survival and allowed weight recovery of the survivors whereas the untreated group died within five days.

"There were cases when the suppressive effect of CCB on IAV infections was comparable to that of an existing anti-flu drug. We expect that the interaction between IAV and the Ca^{2+} channel could be a novel and important target for future drug development," says Yusuke Ohba.



Human bronchial epithelial cells cultured with (bottom) or without (top) a calcium channel blocker (CCB) prior to exposure to IAV. Red signals show infected and replicated IAV.

Citizen science

A powerful tool to combat invasive giant slugs

Photo by Sanae Watanabe

With the help of citizen science, researchers have unraveled the close correlation between weather conditions and the appearances of a giant slug species, enabling them to predict the slug's activity on the following day.

The giant slug *Limax maximus*, an invasive species which made its way from northern Europe to Japan and other regions worldwide, is notorious for the harm it can cause to horticultural and agricultural crops. A research team led by Yuta Morii of Hokkaido University previously reported the spread of the species and its potential native predator in Japan.

Dr. Yuta Morii of Hokkaido University

In the current study published in *Science of the Total Environment*, Morii and his collaborators found that a certain set of weather conditions could be a reliable short-term indicator of how often giant slugs would appear on a set mountain path. The findings showed that the slugs were more likely to appear on days with higher humidity and lower windspeed and precipitation than the 20-year average. Furthermore, following days which recorded higher than average humidity and precipitation and lower than average windspeed and atmospheric pressure, the number of slug appearances tended to increase. They used the findings to make predications regarding future slug sightings.

This study was made possible by citizen science. In order to survey the number of slugs present on the path, volunteer naturalist Sanae Watanabe hiked the Mt. Maruyama route, in Sapporo, Japan, at 5:00 AM nearly every day for two years. At the same time, researchers were feeding weather data obtained from a Sapporo City meteorological station located 2 kilometers from Mt. Maruyama into a computer. They then conducted statistical analyses using a recently developed method known as Bayesian regularization, which elucidated the correlation between slug appearances and complex weather conditions.

"Citizen science is a powerful tool to combat the challenges created by invasive species. Our study emphasizes the importance of collaborations between researchers, government administration, and citizen volunteers. We hope that our prediction method can be used in the future to develop targeted eradication policies against slugs." said Yuta Morii.

2018 Hokkaido University Festival

A lively 3-day event comprised of 10 festivals bringing together students and university clubs, allowing them to showcase their expertise and activities.

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