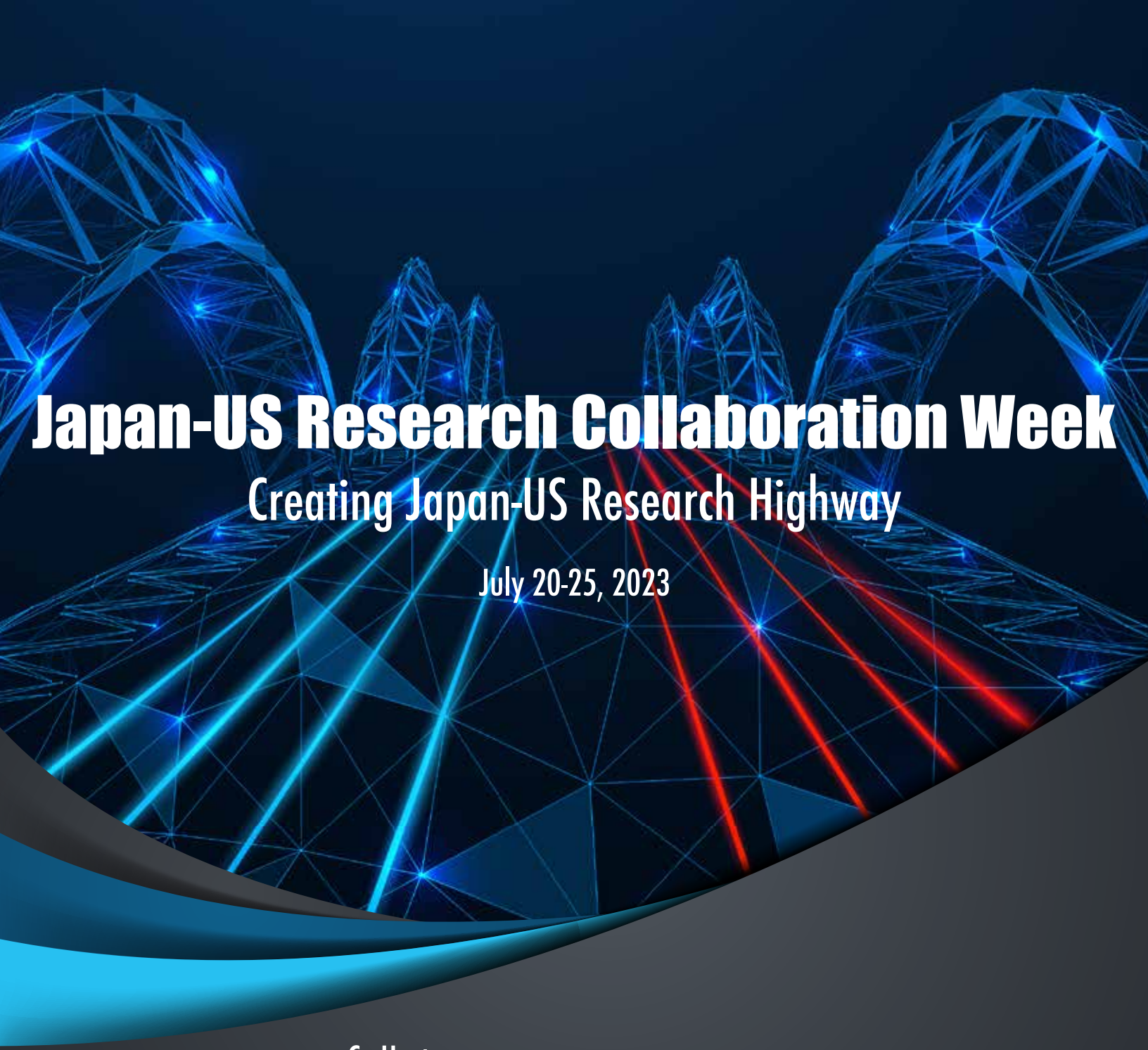

Japan-US Research Collaboration Week

Creating Japan-US Research Highway

July 20-25, 2023

Co-Hosts

Stanford University School of Medicine
Japan Science and Technology Agency (JST)
Kanagawa Prefecture, Japan Agency for Medical Research and Development (AMED)
Japan Society for the Promotion of Science (JSPS)
Nagoya University, United Japanese Researchers Around the World (UJA)

Supporters

Consulate-General of Japan in San Francisco
Japan External Trade Organization (JETRO)

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Introduction

The Japan-US Research Collaboration Week was held on July 20-25, 2023 at Stanford University in Stanford, California. The week-long symposium is hosted by the Stanford University School of Medicine, Japan Science and Technology Agency (JST), Kanagawa Prefecture, Japan Agency for Medical Research and Development (AMED), the Japan Society for the Promotion of Science (JSPS), Nagoya University, and United Japanese Researchers Around the World (UJA). The Consulate-General of Japan in San Francisco and the Japan External Trade Organization (JETRO) also provided support for the event.

The Japan-US Research Collaboration Week aims to accelerate research collaboration between Japan and the United States, particularly in the fields of science and technology. By fostering collaborations and partnerships between Japan and the United States, we can establish trust networks and build a community of diverse and highly talented researchers. These networks will be valuable assets to society and encourage innovation, especially when tackling global issues and crises. Furthermore, they will contribute to the development of the next generation of human resources, fostering peace and stability in the Pacific region.

This is a unique opportunity for new stakeholders to participate in ongoing research collaborations that are either already successful or on track for success. By learning from these collaborations, stakeholders can gain insight into the "Research Highway," which is being developed as a mechanism to accelerate research collaboration between Japan and the United States and link the research outcomes to social implementation and commercialization.

History

This week-long research symposium emerged from the Japan Science and Technology Agency-Stanford Initiative (JSI), which was launched in 2021 with the aim of creating a foundation for research exchange among a group of universities, research institutions, and companies in Japan and the United States. Japan Science and Technology Agency (JST) and Stanford University serve as a hub for this activity.

In December 2021, the Department of International Affairs of JST and the Department of Anesthesiology at Stanford University signed a "memorandum of cooperation" (MOC) regarding research cooperation between Japan and the United States, and it was renewed in January 2023 for 2 years. Based on the memorandum, the Research Institute for Drug Discovery, and Medical Device Development at Stanford University along with the JST Washington, D.C. Office have planned and implemented joint symposiums and workshops several times a year through regular weekly meetings.

In addition to inviting top scientists from Japan and the United States, the JST and Stanford University invite the stakeholders of the research and development projects that these scientists are working on to joint symposiums, research meetings, and concrete research collaborations, and are nurturing communities bound by trust to serve as the foundation of a research highway between Japan and the United States.

In parallel with JSI, Stanford University has had a research collaboration with Kanagawa Prefecture for more than 10 years in the field of ME-BYO, the state of the body and mind between health and illness. Stanford University, JST and Kanagawa Prefecture agreed to co-host the Japan-US Research Collaboration Week (JURC) and to engage broader stakeholders in the research community.

JURC 2023 is a part of creating the research highway between Japan and the United States.

Agenda

FORMAT	In-person
VENUE	Stanford University. Locations included Beckman Center, Munzer Auditorium, and Li Ka Shing Center For Learning (LKSC).
LANGUAGE	English
DATE & TIME (PDT)	• Day 1: July 20 (Thu) 8:30-11:00, 15:30-18:00 • Day 2: July 21 (Fri) 8:30-11:00, 15:30-18:00 • Day 3: July 22 (Sat) 9:30-17:30 • Day 4: July 24 (Mon) 8:30-11:00, 13:10-18:10 • Day 5: July 25 (Tue) 8:45-17:15

July 20 (Thu) – Morning Session: ME-BYO: Social Demands and New Industrial Potential

Session organizers: Kanagawa Prefecture & Stanford University

Japan's population is aging at a faster rate than the rest of the world, leading to challenges such as increasing social security costs and a shrinking workforce. In response to this, Kanagawa Prefecture has defined "ME-BYO" as the state of the body and mind between health and illness. Over the past decade, Kanagawa Prefecture has been collaborating with Stanford University to actively pursue the creation of new industries that intervene in this state, aiming to achieve a healthier and higher quality of life. The funding agencies and research institutes gathered at this event are actively promoting Japan-US research collaboration to explore the boundless potential for disruptive innovation at the intersection of science and society. We will delve into how we can drive innovation in our society by bridging the gap between science and industry, while fostering synergies throughout Japan-US collaboration.

July 20 (Thu) – Afternoon Session: Tracking our Health Trajectories

Session organizers: Kanagawa Prefecture & Stanford University

In order to ensure a healthy and high quality of life in our aging society, we strive for ultra-early disease prediction and intervention, surpassing today's conventional treatment approach that relies on the detection of symptoms. To accomplish this, we require multi-layered approaches, including cutting-edge research and development of technologies, as well as creating the ME-BYO industry. By leveraging the gathering of stakeholders at Stanford, we will showcase the latest advancements in novel research activities. This will provide valuable opportunities for international, inter-sectoral, and inter-organizational collaborations, fostering a strong environment for innovative breakthroughs.

July 21 (Fri) – Morning Session: Transdisciplinary Challenges for Mental Resilience

Session organizers: Kanagawa Prefecture & Stanford University

The social issues related to mental states have expanded and become increasingly severe, necessitating our attention and focus. How can we effectively address this situation? The key lies in developing a comprehensive understanding of mental states and promoting empathetic interpersonal and intergroup communication that guides us in a mutually beneficial direction. To achieve this, we seek transdisciplinary collaboration to understand and intervene in our society's mental states, including developing technology that provides peace of mind and vitality. To promote research collaboration, we will showcase cutting-edge activities in novel research development. Furthermore, we will explore expectations for the focus of future Japan-US collaborations.

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July 21 (Fri) – Afternoon Session: How Have We Worked Against COVID-19?

Session organizers: Kanagawa Prefecture & Stanford University

The COVID-19 pandemic claimed many victims and severely impacted the global economy. This crisis served as a stark reminder of society's vulnerability to infectious diseases. However, the crisis has been a chance for innovation. As scientists we confronted this situation, and we contributed to the transformation of society and science. In this reflection, we will look back at the collaborative efforts of academic institutions worldwide, outlining our collective fight against the pandemic and reflect on lesson learned from this crisis. We will also discuss ongoing initiatives and opportunities calling for international collaboration.

July 22 (Sat): Building Networks of Diverse and Highly Talented Researchers

Session organizers: Japan Agency for Medical Research and Development, Japan Science and Technology Agency, Japan Society for the Promotion of Science & United Japanese Researchers Around the World

In the pursuit of promoting sustainable international research collaborations, it is important to advance institutionalized efforts with a deep understanding of the realities faced by researchers going abroad and the circumstances of host institutions. With this in mind, JSPS has worked to strengthen the impact of its fellowship programs and other supportive mechanisms. This year, AMED and JST launched a new program called ASPIRE (Adopting Sustainable Partnerships for Innovative Research Ecosystem). This program is designed to facilitate international research collaborations, including the mobility and circulation of international talent with the ultimate goal of establishing long-term collaborative networks. In this one-day event, we aim to bring together students, researchers, and administrators from Japan and the United States, fostering a vibrant environment for research collaboration. By leveraging the ongoing activities and experiences of participants, we aim to accumulate invaluable lessons and engage in discussions to gain insights into effective mechanisms that facilitate cross-border collaborations among researchers, universities, and funding agencies, ultimately accelerating the pace of collaboration.

July 24 (Mon) – Morning Session: Next-generation Technologies for Micro-sampling

Session organizers: Stanford University School of Medicine & Nagoya University Graduate School of Medicine

In 2021, a groundbreaking international collaboration between Stanford University and Nagoya University was launched centered around the core concept of "Health is a product of the Genome & Exposome." The collaborative effort took shape as the "Japan-U.S. Joint Cohort Study to Elucidate the Factors of Individual Differences in Responses to Health and Disease." In this enlightening session, we will provide an overview of this international collaborative research and introduce future health profiling approaches across diverse populations, created by the utilization of next-generation technologies, such as dynamic health profiling through integrated analysis of wearables and multi-omics data.

July 24 (Mon) – Afternoon Session: Future of Electronics with New Semiconductors

Session organizers: Stanford University School of Engineering & Nagoya University Institute of Materials and Systems for Sustainability

Professor Chowdhury's group at Stanford University and the Center for Integrated Research of Future Electronics at Nagoya University are working closely together to establish future electronics with new semiconductors that will transform our lives. Within this framework, companies related to future electronics from Japan and the United States will present their vision.

July 25 (Tue): Fostering Global Business Growth through Industry-Academia Collaboration

Session organizers: Stanford Laboratory for Drug, Device Development and Regulatory Science & SOZO Ventures

The pursuit of multilayered collaboration between business and academia in Japan and the United States necessitates a comprehensive understanding of the current state of industry-university collaboration in Japan and the United States. Since the academic environment differs in Japan and the United States, bringing the American model to Japan and vice versa may not always work. By extending invitations to accomplished deep-tech startup companies, successful university commercialization programs, thriving investors, and exemplary education programs, we intend to underscore the importance of universities and startups. Additionally, as organizers of this session, we aim to engage in discussions with startups and investors regarding the emerging model of global industry-academia collaboration that is anticipated in the future. Join us as we embark on the journey akin to an "Academia's Davos meeting" in the times to come.

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Day 1 Sessions

Opening Remarks

The workshop began with opening remarks from four distinguished speakers.

Remarks by Dr. Toshihiko Nishimura, Director, Stanford Lab for Drug, Device Development and Regulatory Science (SLDDDRS)

Dr. Nishimura began by welcoming the participants and guests to Stanford University. He emphasized the success of the joint research and clinical trials that have been carried out within the Japan-US research collaboration. He also noted that the collaboration has grown and flourished despite the challenges created by the COVID-19 pandemic.

Welcome Speech by Dr. Lloyd B. Minor, The Carl and Elizabeth Naumann Dean, Stanford University School of Medicine

Dr. Minor welcomed the participants and guests to the research collaboration, and introduced the governor of Kanagawa Prefecture, Yuji Kuroiwa, as a guest of honor. He then thanked Dr. Ronald Pearl (Stanford University School of Medicine) for his role in ensuring the success of the research collaboration. Dr. Minor stressed the importance of collaborations for achieving medical breakthroughs and highlighted how collaborations have helped us develop COVID-19 vaccines. He also emphasized the importance of the ongoing research collaborations between Japan and the United States for future scientific developments.

Presentation by Dr. Ronald Pearl, Professor and Former Chair of Anesthesia Department, Stanford University School of Medicine

Dr. Pearl highlighted the growth of the research collaboration, and introduced the organizations represented in the symposium. He noted Governor Kuroiwa's important role in furthering research collaborations, and discussed the role that each participating organization has played in furthering the goals of the US-Japan research collaboration. He then discussed the value of collaborations, stressing the importance of bringing together people with different ideas, perspectives, and expertise to achieve common goals and develop innovative solutions for pressing social problems. He also gave some examples of how collaboration has enabled many of the medical breakthroughs that have been instrumental in combatting COVID-19.

Brief Remarks by Yasushi Noguchi, Consul General, Consulate-General of Japan in San Francisco

Mr. Noguchi stressed how grateful he is for all of the valuable research being featured in the symposium, and how important the collaboration is for achieving scientific breakthroughs. He also thanked all of the thought leaders and organizations whose hard work has allowed the research collaboration to take place, and emphasized that he is looking forward to seeing the research presentations.

ME-BYO: Social Demands and New Industrial Potential

Healthcare New Frontier Policy

The Honorable Yuji KUROIWA, Governor of Kanagawa Prefecture

Governor Kuroiwa, who recently received the "Healthy Ageing 50" award[1] for his work on making the world a better place to grow old, spoke about how Kanagawa Prefecture is working with other stakeholders in Japan to tackle the challenges of an ageing population. Japan has taken a leading role in implementing healthy ageing initiatives.

[1] The 'Healthy Ageing 50' awards were presented by the UN Decade of Healthy Ageing to 50 government, civil society, industry and academic leaders transforming the world to be a better place to grow older. See: https://www.decadeofhealthyageing.org/topics-initiatives/other-initiatives/healthy-ageing-50

Remarks by organizer's representatives (from left: Dr. Nishimura, Dr. Minor, Dr. Pearl)

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Kanagawa Prefecture's Healthcare New Frontier policy package centers on the concept of "ME-BYO," which, in traditional Eastern medicine, is defined as a state of being neither healthy nor sick. Kanagawa Prefecture builds upon this concept by classifying the body's condition as being in a state of constant transition that cannot be strictly categorized as being either healthy or sick. The concept treats health as a spectrum, and focuses on the improvement of health in everyday life using diet, exercise, and social activities.

The Healthcare New Frontier Policy also combines the ME-BYO concept with advances in medical technologies from robotics and AI to further health longevity, and to develop new industries and markets. Kanagawa Prefecture has brought together key stakeholders by organizing the ME-BYO Industry Association, which currently has 1,049 members. Health information and communications technology (ICT), such as smartphone apps, is a key component of ME-BYO. The KING SKYFRONT open innovation hub[2], near Haneda airport, is another important source of health-based collaborations and research. The hub is home to the School of Health Innovation, which fosters healthcare technology innovations.

Kanagawa Prefecture is also a part of the WHO Global Network for Age-friendly Cities and Communities, highlighting the Prefecture's leadership role on healthy ageing. Furthermore, the ME-BYO index was developed in collaboration with University of Tokyo to guide people towards healthy living. Governor Kuroiwa concluded by highlighting some of the community initiatives and events to foster healthy ageing that have been launched in Kanagawa Prefecture.

Governor Kuroiwa's Presentation on the Healthcare New Frontier Policy

[2] KING SKYFRONT open innovation hub: https://www.king-skyfront.jp/en/

Stanford-CIEA Collaboration History and Future

Dr. Ryuta NOMURA, Chairman & CEO, Central Institute for Experimental Animals (CIEA)

Dr. Nomura briefly discussed the history of the collaboration between CIEA and Stanford University, noting that the two organizations are collaborating on several mutual projects. He then introduced CIEA's work to improve human health by using experimental animals, such as Tg-PVR mice, Tg-rasH2 mice, NOG mice, and common marmosets. The CIEA was one of the first organizations that moved to the KING SKYFRONT open innovation hub in Kanagawa Prefecture. Today, the KING SKYFRONT hub includes numerous drug discovery, regenerative medicine, research, and medical device companies and institutions, many of which collaborate with the CIEA to solve important scientific problems.

Dr. Nomura's Presentation on the Stanford-CIEA Collaboration

Japan-US Research Collaboration Week, Creating Japan-US Research Highway

Dr. Ei YAMADA, President & CEO, AnGes, Inc. / President, SAMURAI Biotech Association

Dr. Yamada presented on the value of Japan-US research collaborations and how to facilitate more collaboration. His company, AnGes, Inc., is a Japanese gene therapy company founded in 1999 with headquarters in Osaka. He highlighted the recent successes of AnGes, including the conditional approval of its 'Collategene' HGF gene therapy in 2019, and the positive results from a study of a treatment for lower back pain in 2021. In 2022, AnGes collaborated with Stanford University to develop a nasally-administered COVID-19 vaccine. AnGes also recently acquired a US-based medical startup that develops cutting-edge gene therapies. In the future, AnGes plans to expand collaborations by including additional companies and universities in its scientific initiatives.

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Why is JST Here Today?

Dr. Kazuyoshi SHIMADA, Director, Washington DC Office, Japan Science and Technology Agency

Dr. Shimada presented on JST's mission and activities. JST is a mission-oriented funding agency that connects various stakeholders to drive high risk research that generates real value for global society and the public good. JST is a key stakeholder in the Japan-US Research Collaboration Week (JURC), and is working on creating the "Japan-US Research Highway." The Research Highway will encourage the regular exchange of ideas and proposals between the US and Japan, and will foster unique research collaborations. In 2021, JST launched the JST-Stanford Initiative (JSI), a hub for scientific collaborations led by Stanford University and JST. Dr. Shimada closed his presentation by noting the need to identify and incorporate key stakeholders to further improve the success of these collaborations moving forward.

Introducing AMED's Activities and Invitation to the Sessions on July 22

Mr. Takuto MIYAMOTO, Director, Washington DC Office, Japan Agency for Medical Research and Development (AMED)

Mr. Miyamoto presented on the activities and mission of the AMED Washington DC. Within the Japanese government, the AMED functions as a one-stop service for medical research funding and consistently manages research activities from basic to practical use in Japan. In 2021, President Biden and Prime Minister Suga launched the Japan-U.S. Competitiveness and Resilience (CoRe) Partnership, which reinforces the collaboration between the US National Institutes of Health (NIH) and the AMED. Through this partnership, the two organizations are working together on infectious diseases, cancer studies, and talent mobility. He encouraged the attendees to join the July 22 session on "Building networks of diverse and highly talented researchers" to learn more.

Mr. Miyamoto's presentation on the AMED's activities

JSPS and Its International Program

Dr. Yusaku NAKABEPPU, Director, San Francisco Office, Japan Society for the Promotion of Science

Dr. Nakabeppu presented on the activities and mission of JSPS, which was established in 1932 as Japan's core funding agency for academic research. JSPS operates under the Ministry of Education, Culture, Sports, Science, and Technology (MEXT), and supports basic applied research conducted based on curiosity-driven research across all disciplines, including social sciences, natural sciences, and humanities. JSPS seeks to foster world-class knowledge in diverse fields, and the next generation of researchers. JSPS has offices across the world, including in Bonn, London, Nairobi, and Cairo. The agency's international program is designed to foster international research collaborations and support for outbound young Japanese researchers. Bilateral collaborations in countries that have diplomatic relations with Japan are carried out through the Joint Seminars program. Currently, JSPS has a partnership with the National Science Foundation (NSF) to foster research in the humanities, social sciences, and natural sciences. JSPS is aiming to develop a research network that includes all countries.

JETRO: Your Partner to Expand Your Opportunity to Get into Japanese Market

Mr. Yotetsu HAYASHI, Chief Executive Director, Japan External Trade Organization (JETRO) San Francisco Office

Mr. Hayashi presented on JETRO's activities and mission. JETRO provides business support to companies seeking to expand to Japan. The organization has 76 offices in over 50 countries and 48 domestic offices serviced by over 2,000 workers, including seven offices in North America. In the United States, JETRO has three major missions: 1) supporting Japanese companies with setting up business in the United States, 2) introducing Japanese small and medium enterprises to the United States, and 3) assisting American companies with initiating and expanding their business presence in Japan. Mr. Hayashi noted that Japan is currently a major source of foreign direct investment in the United States. JETRO offers several services to its clients, including market information, business consultations, office space, identifying subsidy programs, assistance with incorporation, and introductions to business partners.

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Mr. Hayashi's presentation on JETRO

A Proposal for Collaboration with Kyoto: Long-term Local Sustainability in the Ancient Capital

Dr. Michiyo YAMAGUCHI, Vice President, Kyoto Prefectural University

Dr. Yamaguchi introduced a proposal for collaboration between Stanford University and Kyoto Prefectural University (KPU), a university serving the local community in Kyoto that was founded in 1895. Dr. Yamaguchi discussed the history of Kyoto, and highlighted major companies that were founded in Kyoto, such as Nintendo. At KPU's Center for Frontier Natural History, which was recently founded, researchers are engaged in important environmental research such as conducting forest evaluation and planning using remote sensing. Dr. Atsushi Nakao is leading another research project on ophiolite (oceanic plate) ecosystems. KPU researchers are also using ostrich cells to make glowing COVID-19 detection masks.

VIDO as Canada's Centre for Pandemic Research

Dr. Paul D. HODGSON, Director of Operations, Vaccine and Infectious Disease Organization (VIDO), University of Saskatchewan

Dr. Hodgson presented on the Vaccine and Infectious Disease Organization (VIDO). VIDO is a leading institute in vaccine development in Canada. The institute has commercialized 8 vaccines, of which 6 were world firsts. The institute has considerable animal modeling expertise, in which animal diseases are modeled as human diseases. The institute also played a major role in Canada's COVID-19 response and was expanded into "Canada's Centre for Pandemic Research" as part of Canada's pandemic preparedness infrastructure. VIDO has established partnerships around the world, including in Tokyo. Moreover, VIDO has interacted with several institutions in Japan, including the National Institute of Science and Technology Policy (NISTEP) and Vaxxinova Japan. In the future, VIDO plans to expand its international collaborations to drive infectious disease research and technology development.

New Opportunities and Challenges in Japan-Taiwan Collaboration on Cutting-Edge Technology

Dr. Jeff CHEN, Professor, College of Management, Department and Graduate Institute of Business Administration / College of Medicine, National Taiwan University

Dr. Chen presented on research collaborations between Japan and Taiwan. In 2019, Kyoto University sent a delegation to National Taiwan University (NTU), setting the groundwork for future collaborations between the two institutions. National Taiwan University has also collaborated with the CiRA Foundation, an iPS cell manufacturer that is part of Kyoto University's Center for iPS Cell Research and Application, to automate the manufacturing of quality control (QC) testing devices. Other collaborations between NTU and CiRA have yielded innovations in areas such as gene editing methods, 3D culture methods, automated closed culture systems, and non-invasive QC tests.

Unlocking Japan's Innovation Potential: Accelerating Venture Development in Japan

Mr. Phil WICKHAM, Founder and General Partner, Sozo Ventures

Mr. Wickham presented on strategies for accelerating venture development in Japan. His company, Sozo Ventures, was formed in 2012 to invest in and support technology-enabled ventures with their global expansion. Sozo is now engaging in conversations with JST on how to commercialize data technologies, and how to bring more venture capital to emerging companies. He also introduced an upcoming symposium on accelerating venture development featuring several leading experts. Wickham stressed that identifying innovators is difficult. Once they have been identified, it is key to put innovators into a platform where they can be successful. Once selected, the innovators will primarily

Attendees on Day 1

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require resources to flourish. It is also important to build an ecosystem around innovators that connects them to the rest of the world.

Presentation by Mr. Wickham on Japan's innovation potential

Tracking Our Health Trajectories

This session focused on how to address the challenges associated with an aging society. Presentations in this session showcased the latest advancements in novel research activities and technology development related to ultra-early disease prediction and intervention.

Efforts to Manage ME-BYO by Kanagawa Prefecture

Dr. Ung-Il CHUNG, Executive Board Member, Vice President and Dean, School of Health Innovation, Kanagawa University of Human Services / Professor, Graduate Schools of Engineering and Medicine, The University of Tokyo

Dr. Chung opened by arguing that the current mindset in Japanese society, which tells people to go to the hospital when they get sick, and to care for elderly relatives, is unsustainable. The mindset for the future will require everyone to care for their own health, and for elderly people to support society by maintaining healthy lifestyles. A recently developed ME-BYO index provides an example of how new tools and concepts can help individuals understand their own health, and take the appropriate measures to maintain a healthy lifestyle.

The ME-BYO index helps visualize the ME-BYO status of individuals, treating their health as a spectrum, rather than a dichotomy between healthy and sick. The index helps predict an individual's future capacity and allows for comparisons between their future, past, and present health. These comparisons may motivate individuals to improve their future capacity through behavioral change. As more data is collected, the predictions can become more accurate. The ME-BYO index comprises 15 items from 4 categories, including lifestyle habits, cognitive functioning, life functions, and mental health and stress. The ME-BYO index data is collected with a smartphone app that allows individuals to track and measure their physical and mental health.

The personalization of the ME-BYO index is designed to promote healthy behavioral change. Furthermore, the app makes predictions about an individual's future health and suggests how their health can be improved through behavioral change. The application also generates three outcome indices that are used to validate the ME-BYO index. These outcome indices are the extension of health longevity, maximization of quality of life, and medical care cost/long-term care cost. There are three levels of the ME-BYO index: 1) the simplified index, 2) the detailed index, and 3) the commercial index. The first level was developed by Kanagawa Prefecture, the second level by academia, and the third by companies. It is envisioned that the ME-BYO index will be used by individuals, companies, and social systems. Companies can use the index to market new health products, while municipalities can use the index to improve public health interventions.

Presentation by Dr. Ung-Il Chung on managing ME-BYO in Kanagawa Prefecture

Early Diagnosis of Cancer through Exosome-derived RNA

Dr. Utkan DEMIRCI, Professor, Department of Radiology, Stanford University

Dr. Demirci presented on his cancer research at the Canary Center at Stanford for Cancer Early Detection. The center is dedicated to improving the early detection of cancer to improve cancer survival rates. Dr. Demirci's lab primarily works on extracellular vesicle isolation and analysis. It was discovered in 2013 that vesicles play an important role in cellular signaling and provide a great amount of information about the cell. Exosomes, which extracellular vesicles generated by cells, can be isolated from blood, urine, and saliva through various methods. Isolating

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and examining exosomes can yield important information about cancer. Dr. Demirci's lab developed a method that uses nanofiltration to isolate extracellular vesicles. This exosome isolation technology is currently being marketed.

Extracellular vesicles are being used in several clinical programs. One study aims to develop a more specific biomarker, imaging test, or a combination of the two for intervening early in patients. Moreover, exosomal genomics can be used to identify lung cancer early. The extraction technologies need to be integrated with imaging technologies, such as liquid biopsies, so that new assays can be developed to enhance clinical diagnostics. Moreover, machine learning and other computational methods will become increasingly important for determining the risk of disease from genomic material like RNA.

Remarks for the Session "Tracking Our Health Trajectories"

Dr. Gen SOBUE, Chairperson, Aichi Medical University

Dr. Sobue emphasized the importance of early disease detection and prevention. Japanese researchers are setting several ambitious "moonshot" goals, including achieving ultra-early disease prediction and prevention by 2050. Elucidating pre-disease states is a key element of the Moonshot strategy for disease detection. Ultra-early detection will involve the screening of biomarkers to identify pre-disease network changes that signal the onset of future diseases. Currently, the Moonshot Goal 2 program is working on five major health projects. Four projects are organized by their targeted diseases: cancer, diabetes, dementia, and viral infections. There is also a project that focuses on mathematical analysis to create predictive or preventive algorithms in collaboration with the other four projects. Dr. Sobue concluded by stressing that collaborations will play an essential role in the success of early-diseases detection research programs.

Understanding and Control of Virus-Human Interaction Networks

Dr. Yoshiharu MATSUURA, Director, Center for Infectious Diseases Education and Research (CiDER) and Specially Appointed Professor, Research Institute for Microbial Diseases, Osaka University

Dr. Matsuura presented on his recent research on virus-human interaction networks. Human society is faced with emerging viral infections, which can spread rapidly due to factors such as urbanization and globalization. Because it is challenging to predict viral pandemics and create the appropriate therapeutics and vaccines, it is essential to develop preemptive measures against emerging viral infections. Dr. Matsuura and his colleagues' project aims to support these efforts by cross-classifying viral infections based on the interaction networks from virus to host. Dr. Matsuura's team is classifying viruses based on their biological responses, and has constructed a database containing the information on the biological responses to viral infections. The viruses are then cross-classified based on the host responses upon infection. The team is using biomarkers that are used for viral classification to develop early diagnostics. Thus, innovations in viral classification are contributing to innovations in diagnostics. Moreover, based on the classification schema, new emerging viruses can be quickly classified, allowing for rapid diagnostics and countermeasures.

Many important infectious diseases are caused by RNA viruses, many of which are zoonotic (transmitted from animals to humans) and have no available therapeutics. RNA viruses also mutate very often. Therefore Dr. Matsuura's team is focused on analyzing RNA viruses using mice. Using mathematical models, they analyze patterns of change in immune responses upon viral infections in mice. They found that fibroblasts strongly expressed ISGs and chemokines upon infection, and that mouse-adapted SARS-CoV-2 elicited a strong immune response in mice. They have used this data to develop insights into the immune response to COVID, and to visualize the various cells in a mouse's lung respond to the SARS-CoV-2. This procedure was replicated to generate insights about other emerging infectious diseases, and has the potential to accelerate responses to novel pandemics, and to lead to the development of effective treatments according to the pattern of virus-host interactions. The next stage of their research will be to develop a system that automatically adjusts immune responses according to daily monitoring data.

Comprehensive Mathematical Understanding of the Complex Control System between Organs, and Challenge for Ultra-Early Precision Medicine

Dr. Shusaku HAYASHI, Assistant Professor, University of Toyama

Dr. Hayashi presented on his work in early diagnostics using dynamic network biomarkers, and the Aihara Moonshot (AMS) Project. The AMS project aims to create ultra-early precision medicine to treat pre-disease states using mathematical and comprehensive disease databases. It is currently challenging to find excellent single biomarkers, making it nearly impossible to detect the early warning signals of imminent transitions to disease states. In response to this challenge, the team is proposing a new form of biomarker, called a dynamic network biomarker (DNB), that can provide early warning signals of illness using dynamics with corelated fluctuation.

Dr. Hayashi shared three projects that Toyama University's Saito Group is currently working on. The first project elucidates early disease states using spontaneous metabolic mice. Combining an experimental and mathematical approach, they have found 147 genes that fluctuated substantially and synchronously at 5 weeks.

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The second project aims to elucidate the pre-disease states in inflammatory bowel disease (IBD) in mice using DNB theory. In this project, DNB analysis is used to predict relapse and to intervene to engender long-term remission. Total RNA was extracted from the distal colon at each time point and analyzed with microarrays. The third project is studying hematopoietic tumors by combining DNB theory with Raman spectroscopy. In the future, the initiative will continue to conduct innovative research that will enhance our ability to detect the early warning signs of illness.

Dr. Hayashi's presentation on POC for DNB theory

Deciphering the Molecular Mechanisms of Aging Using Werner Syndrome as a Model

Dr. Yasuo OUCHI, Assistant Professor, Department of Regenerative Medicine, Graduate School of Medicine, Chiba University / Senior Scientist, Altos Labs Inc, San Diego Institute of Science

Dr. Ouchi presented on research that provides new insights into the molecular mechanisms of aging. An aging society presents an important global social challenge. Werner syndrome (WS) is a disease in which the human organism ages rapidly, and about 80% of cases of WS are reported in Japan. WS provides the best human model for elucidating the molecular mechanisms of normal aging. Researchers at Chiba University are working to understand WS using multiomics analysis, and are the world's foremost experts on the disease.

Mitochondrial dysfunction is a key molecular mechanism that leads to aging. Dr. Ouchi's research team used multiomics analysis to identify saccharopine as a contributor to accelerated aging. The researchers discovered that WS patients exhibit increased giant mitochondria formation and decreased mitochondrial function, which drives their accelerated aging. Moreover, saccharopine (a mitochondrial toxin) was found to be significantly higher in WS patients, making it a potential non-invasive biomarker for both normal aging and WS. During their research into treatments for WS, the researchers discovered that the induction of WRN Exon 27 skipping can rescue the expression of functional WRN proteins in WS patients.

Dr. Ouchi's presentation on the molecular mechanisms of aging

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Day 2 Sessions

Transdisciplinary Challenges for Mental Resilience

Introduction of Moonshot Goal 9

Dr. Seiji KUMAGAI, Associate Professor, Institute for the Future of Human Society, Kyoto University / Program Director, Moonshot R&D Program Goal 9

The "Moonshot Research and Development Program," launched by Japan's Cabinet Office, aims to resolve challenging social problems by supporting complicated research and development projects. Dr. Kumagai presented on the ninth goal of the program (MS9), which is to enhance mental well-being through "Kokoro-tech," comprising of technologies that support the mind, heart, and spirit. Researchers aiming to achieve MS9 are developing technologies and services that increase peace of mind and vitality. MS9 has set two targets to be achieved by 2050: 1) people in society will have high mental stability and take an active role in improving their own happiness; 2) society accepts diversity, embraces the use of technology to enhance empathy and creativity, and disseminates mental support services across the world. Several R&D projects are currently underway to make these goals a reality.

There are currently 6 core research projects and 6 feasibility study projects. One core research project seeks to integrate ancient humanities and Buddhist meditation with brain informatics to enhance mental peace and vitality. Another core research project is developing an at-will translator that will facilitate more effective communications between individuals and groups. The current feasibility studies include projects that aim to create environments that effectively protect children's intellectual curiosity, to better understand the cognitive regulatory basis of food value in feeding behavior, and to construct an IoT-based emotional state sensor.

Dr. Kumagai's presentation on Japan's Moonshot Goal 9

NSF Social Psychology Program

Dr. Steven BRECKLER, Program Director, National Science Foundation (NSF)

Dr. Breckler presented on NSF's Social Psychology Program. NSF provides considerable funding for to social psychology, through NSF's Behavioral and Cognitive Sciences Division. Much of the research funded by NSF is focused on resilience, which is a key topic area in social psychology. Examples of NSF-funded projects include projects focusing on why some people are more resilient to trauma, illness, stress, and stigma, and how to effectively intervene. Moreover, NSF tends to fund work that focuses on promoting positive health rather than research on specific disease outcomes.

A significant number of NSF-funded projects are studying how close relationships support positive mental health. More recently, a growing number of projects are focusing on social development. These projects focus on the developmental origins of resilience and coping mechanisms. Social neuroscience is another important component of NSF's project portfolio. Much of this work, which seeks to develop better understandings of central neural mechanisms of emotion expression, emotion perception, and cognition, is funded in partnership with NSF's cognitive neuroscience program. Another growing portfolio area is computational modeling and network modeling, which is key to understanding human cognition and human networking.

NSF's smart and connected health program is unique in that it is a formal collaboration between NSF and NIH. The program is noteworthy for researchers working on MS9 goals because it is open to research on mental health. Furthermore, NSF is very interested in supporting novel health technologies related to MS9 in collaboration with NIH.

Mental Health and Wellbeing Coming Out of the Silo

Dr. Victor G. CARRION, Professor and Vice-Chair of Psychiatry and Behavioral Sciences, Stanford University School of Medicine

Dr. Carrion presented on the challenges of improving social mental health outcomes. Mental health represents an important public health issue, especially since mental health and physical health are inextricably linked: it is difficult to have one without the other. Mental health was recently recognized as the number one cause of morbidity; however, there are several challenges to addressing this crisis, such as a lack of recognition and stigma, as well as low access to mental healthcare. There is currently a considerable gap between the amount of people who need mental health services, and those who can access mental health services. There is also a quality gap in care. Currently, 55% of cases of mental illness and almost 90% of substance use disorders are not being treated. Moreover, the rising rates of psychiatric

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disorders are having a negative impact on the economy, reducing educational attainment, and increasing rates of crime and incarceration. Society, in turn, also impacts rates of mental health. Social media and the COVID-19 pandemic, for instance, have been linked to higher rates of mental illness.

Supporting mental health literacy is an important community-level intervention that could lead to improvements in societal mental health outcomes. Methods for improving mental health education and literacy include government grants to fund mental health awareness trainings, mental health literacy training packages for teachers and educators, and trainings on how to respond to mental health or substance use. For example, in California, Stanford Medicine's allcove initiative offers youth-centered care for mental illness through a holistic and affordable approach. Further, a study by Dr. Carrion brining yoga and mindfulness to schools improved sleep outcomes among youth.

Dr. Carrion's presentation on societal mental

How We Can Predict Mental Problems – The Human Voice Cannot Lie

Dr. Shinichi TOKUNO, Professor, Graduate School of Health Innovation, Kanagawa University of Human Services / Project Professor, Graduate School of Engineering and Medicine, The University of Tokyo

Dr. Tokuno presented on an innovative, noninvasive mental health screening technology that improves on existing objective screening methods for stress and cognition. Currently self-report questionnaires are the most common methods of screening for stress or cognition. Blood, urine, and saliva tests are other reliable methods but have high costs due to their reliance on special equipment and chemicals. Physiological testing is an alternative screening method that is noninvasive and low cost, but requires special equipment. Furthermore, screenings for stress and cognition often suffer from reporting biases. Dr. Tokuno and his team developed a screening method for stress and cognition that uses voice pathophysiology analysis (vpa) to screen for stress. In plain terms, this method can determine stress levels from the emotion in a patient's voice.

A pilot study of the screening method was conducted on 1,004 soldiers who were dispatched to the Great East Japan Earthquake, and a control group of 444 soldiers who were sent on a routine mission during the same time. Out of this sample, 225 soldiers were selected for interviews. Findings from the study demonstrated that the voice-based emotional screening was more effective in identifying stress among the soldiers than conventional screening techniques. The voice analysis stress test has been adopted by Kanagawa Prefecture as a ME-BYO index measurement item.

Psychological Resilience: An Emotion Regulation Perspective

Dr. James GROSS, Professor of Psychology and Professor of Philosophy (by courtesy) / Director, Stanford Psychophysiology Laboratory, Stanford University

Psychological resilience reflects a person's response to a stressor, such as a job loss. Exposure to stressors is a robust predictor of disrupted psychological functioning. However, people differ substantially in how they respond to stressors: some people show strong negative responses to stressors, while others do not. The question then becomes: what are the mechanisms that explains why some people are more resilient to stressors than others? Recently, there has been a dramatic increase in the number of studies that are seeking to answer this question by studying emotion regulation, which are the processes that influence which emotions one has, and how one experiences and expresses these emotions.

Importantly, the emotional regulation process can be conceptualized as a series of cycles, going from situations, to attention, to evaluation, to the response to the situation, and finally back to the situation. These emotion cycles occur and reoccur over time. Five families of emotion regulation processes are based on the point in the cycle in which they intervene. Changing the emotional regulation process requires an intervention at one of the five points in the cycle. For example, response modulation changes the response phase of the cycle, while cognitive change changes the evaluation phase of the cycle.

Current research focuses on two emotion regulation strategies: suppression and reappraisal. Suppression refers to decreasing ongoing emotion-expressive behavior, while reappraisal refers to modifying the meaning of a situation to decrease its impact. Suppression can have considerable negative effects on people and doesn't necessarily help people to feel better. Reappraisal, on the other hand, has no comparable negative effects, and therefore represents a superior emotional regulation strategy. Since stress among adolescents is a serious societal problem, interventions that teach them reappraisal strategies for stressful situations can effectively help them to reduce stress. Dr. Gross is working to provide adolescents with synergistic mindsets interventions to

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help strengthen their resilience, while reducing negative affective responses. These interventions were found to be effective in helping participants develop robust emotional responses.

Real Time Emotion Detection / Biomarker for MCI using only simple EEG device

Dr. Yasue MITSUKURA, Professor, Department of System Design Engineering, Faculty of Science and Technology, Keio University

Dr. Mitsukura is an expert in signal processing for noise removal and biomedical signal processing, with six patented products for various types of detection and analysis products, such as real-time facial recognition software using a neural network.

Her KANSEI analyzer is the world's first real-time mental status analyzer, and was selected for the "World innovation best 50," by TIME Magazine. The KANSEI analyzer has been used in a wide range of applications, including visualizing the emotions of dementia patients who cannot speak, brain wave VR simulations, and evaluating the benefits of "workcations."

The KANSEI analyzer fulfills three major needs that simple EEG analysis fails to account for: the need for an easy device for use everywhere; strict signal processing to eliminate noise; and the ability to define "meaning" in the EEG data. The analyzer is also more compact and cheaper than traditional EEG devices.

Dr. Mitsukura closed by sharing two of her recent analyzers that received patents in 2022. One is a Hormone Analyzer using EEG, and the other is studying frontotemporal EEG as a bio-marker for early mild cognitive impairment (MCI).

How Have We Worked Against COVID-19

Opening Remarks

Dr. Ronald PEARL, Professor and Former Chair of Anesthesia Department, Stanford University School of Medicine

Dr. Pearl opened the session by describing some of the key data on the longitudinal trends of COVID-19 cases, deaths, and hospitalizations in the United States and Japan. He also discussed the reasons why we are currently no longer in the pandemic, including mass immunity from vaccination and illness. However, he also stressed that we should not forget about COVID-19, and that we should continue to be vigilant about possible future pandemics.

Dr. Pearl described the development of COVID-19 variants. Current subvariants are much less virulent than early variants of the virus. However, it is possible that future variants will be immune to current vaccines and therapies. During the pandemic, Stanford researchers were on the forefront of COVID-19 research, and authored 1,937 publications on COVID-19. The pandemic also led to an innovation in clinical trials, clinical care, and public health. In the future, lessons from the pandemic should guide how we handle outbreaks of novel illnesses.

Dr. Pearl's opening remarks

Reflections on the Fight Against COVID-19

Dr. Steven SHAFER, Professor, Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine

Dr. Shafer presented on some of the lessons learned from the United States' battle against COVID-19. The United States has an ineffective health data infrastructure, due to the country's healthcare system being fragmented into states and counties, which left an information gap which was filled by academic institutions. Johns Hopkins University (JHU) was instrumental in collecting and aggregating United States COVID-19 data during the pandemic. However, JHU stopped collecting data in October 2023. Since then, Oxford University has been the primary source of weekly COVID-19 data. According to Oxford's data, weekly COVID-19 deaths are at their lowest numbers since March 2020. Furthermore, Japan has had a considerably lower death rate from COVID-19 than the United States. Dr. Shafer noted that some countries, mainly in Eastern Europe, have suppressed their excess mortality data to hide the actual COVID-19 death toll.

In the United States, COVID-19 death rates were patterned according to politics, with states that went to Donald Trump in the 2020 election having significantly higher death rates. Strain data, derived from sequencing COVID-19 DNA, shows that new strains are quickly growing dominant. However, due to global immunity, the virus has had limited changes. Furthermore, the CDC recently projected that COVID-19 deaths will continue to decline to about 500 per week, amounting to 26,000 annual deaths. While this number is far from trivial, the trend is very positive.

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How We Promote Interdisciplinary Research to Coexist with Infectious Diseases Including COVID-19

Dr. Hiroyuki KATAYAMA, Professor, Department of Urban Engineering, School of Engineering, The University of Tokyo

Dr. Katayama presented on new, innovative methods for assessing virus prevalence from wastewater. Wastewater-based epidemiology (WBE) aims to detect viruses and other illnesses from wastewater by estimating the prevalence of viruses in a catchment area. Estimating the prevalence of viruses enables the designation of "safety zones" with a high prevalence of illness. Mutant strains of diseases can also be detected using WBE.

Dr. Katayama's team used WBE to detect the prevalence of COVID-19 in Japan's Olympic Village during the 2021 Olympics. Poliovirus environmental surveillance in the UK since 2014 is another example of successful WBE. WBE was used to detect polio in London's wastewater in 2022, which in turn enabled a rapid public health response. WBE was also used as a clinical surveillance tool at the University of Arizona during a COVID-19 outbreak. By detecting virus RNA in wastewater, the university was able to isolate three infected individuals. In the Netherlands, WBE has been used to create a nationwide COVID-19 dashboard that tracked the average number of virus particles by locality. Low prevalence of the virus in wastewater was a challenge early in the pandemic.

Bureaucratic barriers also presented a challenge in Japan, as lawmakers were hesitant to implement a nationwide water surveillance system. In 2022, the Cabinet Secretariat launched a demonstration study in 20 prefectures.

Passive sampling was used to detect the virus in Japan's Olympic Village during the 2021 Olympics. A passive sampling device is placed in the water pipes and left for 24 hours. Data from the sampling device can be used to estimate prevalence of a virus in wastewater. In a collaborative project (the CREST project), environmental engineers and material sciences researchers developed a new material for passive sampling. Ultimately, WBE has several public health applications, including identifying antibiotic resistant genes and collecting samples for later bio-banking.

Dr. Katayama's presentation on analyzing virus prevalence using wastewater

Intranasal SARS-Cov-2 DNA Vaccine for Respiratory Mucosal Vaccination

Dr. Ramasamy PAULMURUGAN, Professor of Radiology, Stanford University School of Medicine

Dr. Paulmurugan presented on a novel intranasal vaccine technology that offers an alternative vaccination method to currently available vaccines. The SARS-CoV-2 virus consists of a positive-sense single-stranded RNA of the 30kb genome. The viral infects host cells with its Spike protein through Spike-ACE2 interaction, which can lead to a cytokine storm and systemic inflammation. The infection can either be cleared from adaptive immunity, lead to acute infection with a high viral load, or lead to chronic infection. Currently, COVID-19 vaccine platforms include viral vector vaccines, DNA vaccines, antigen presenting cells (APC) vaccines, and virus-like particle vaccines. The vaccines tend to target the Spike protein and each type has a series of side effects owing to their different transmission strategies.

Intramuscular (i.e., injected) vaccines lead to a different immune response than intranasal vaccines. Intranasal vaccination leads to the creation of more protective antibodies, making it potentially advantageous compared to intramuscular vaccines. Intranasal vaccines are also advantageous because they are non-invasive, painless, convenient, work rapidly, have lower side-effects, and increase compliance. Clinical trials of the intranasal vaccines in mice revealed a strong immune response relative to the control group, across anti-spike lgG, anti-spike lgA, and anti-spike lgM. In conclusion, the intranasal Spike DNA vaccine induced an effective antibody response in mice, demonstrating the utility of intranasal vaccine technology for COVID-19 immunization.

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Japan's Vaccine Development Efforts Increasing Preparedness for the Next Pandemic with the Experience of COVID-19

Dr. Hideki UENO, Professor, Department of Immunology, Graduate School of Medicine, Kyoto University

Dr. Ueno discussed initiatives in Japan to develop new vaccine technologies that have been funded by the Japan Agency for Medical Research and Development (AMED) in response to the COVID-19 pandemic. The initiative uses a two-pronged approach by (1) aiming to deliver pandemic vaccines in 100 days and (2) promoting cutting-edge science for the development of next-generation vaccines. Research on human immunology is central to these goals. Part of the initiative is developing world-leading vaccine and R&D centers. The Kyoto University Immunomonitoring Center (KIC) is one of these centers.

One of the KIC's key missions is to standardize the immune-monitoring method to define the immune biomarkers that are needed to predict vaccine efficacy. Standardizing immune-monitoring methods allows for the more effective quantification of immune responses to vaccines, and comparisons of between-vaccine immune responses. In line with this goal, Dr. Ueno's lab is developing a strategy for comprehensively assessing coronavirus-reactive T cells. The T cell responses are analyzed using advanced sequencing technologies. Dr. Ueno's lab has found that COVID-19 infection induces distinct subsets of CoV2-reactive CD4+ T cells. Moreover, the lab discovered that T cell responses activated by COVID-19 mRNA vaccines are predictable at the baseline. Another mission of KIC is to define the immune-vulnerability of high-risk groups, such as the elderly. For example, researchers at KIC have found that elderly males often failed to develop "good T cell responses" against coronaviruses.

Ultimately, the three major aims of KIC are 1) immune monitoring, 2) generating databases for pathogen-specific immunity in Japanese residents, and 3) elucidating pathogen-specific immune responses in infected patients. Dr. Ueno concluded by stressing the importance of collaboration for achieving these goals, and noted KIC's goal of developing additional cross-institutional and global collaborative teams.

Learning from the Past, Preparing for the Future – Our COVID-19 Response

Dr. Darryl FALZARANO, Research Scientist, Vaccine and Infectious Disease Organization (VIDO), University of Saskatchewan

Dr. Falzarano discussed how we can use the lessons from COVID-19 to more effectively prepare for future pandemics. The Vaccine and Infectious Disease Organization (VIDO) researches infectious diseases in animals at the University of Saskatchewan. Dr. Falzarano originally ran a MERS-CoV research program using animal models in alpaca and bats. During the pandemic, his research team transitioned into studying COVID-19 in ferrets and hamsters. At the start of the COVID-19 outbreak, VIDO was able to leverage their infectious disease research resources to develop a SARS-CoV-2 animal model.

The model development included pathogenesis, vaccine efficacy, antiviral efficacy, and Aab/lg efficacy. Using animal models, the researchers were able to build a better understanding of the COVID-19 immune response as well as the symptomology of COVID-19. Based on data from the hamster animal model study, the research team was able to develop a vaccine that elicited neutralizing antibody titers in test subjects. The team also established an African Green Money model for testing vaccine. Dr. Falazarono concluded with a series of lessons from their experiences, such as the following findings: research capacities can be expanded without additional construction, excellent facilities are adaptable, training is hard, and excellent people are required to fulfill potential.

JST/NSF Collaboration in Smart and Connected Communities – "What We Learned from the Last Pandemic – from the Digital Science Perspective"

Dr. David CORMAN, Program Director, National Science Foundation (NSF)

Dr. Corman presented on NSF and JST's collaborations to foster pandemic resiliency and preparedness. NSF and JST are currently collaborating through the NSF Smart and Connected Communities solicitation to address topics related to recovery from COVID-19 and future resilience planning. So far, four projects have been funded at $1.5 million each.

The first funded project studies interventions that can reduce the strain of pandemic-induced social isolation. The second project looks at how societies can use data analytics to implement disaster responses more effectively during an ongoing pandemic. The third project explores how data science and advanced modeling can be used to better respond to pandemics. The fourth project looks at privacy-enhanced mobility and social gatherings' impacts on pandemic risks.

These projects provide several important lessons concerning effective responses to pandemics. First, understanding pandemic and resilience requires socio-technical research. Second, digital science and statistical models are extremely valuable in predicting pandemic outcomes, such as the spread of disease. Third, digital science is very important for informing policy at the highest levels of government. Fourth, dealing with social isolation during pandemics is especially important in modern times because of factors such as aging populations.

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Day 3 Sessions

Building Networks of Diverse and Highly Talented Researchers

Moderator: Mr. Takuto Miyamoto, Director, Washington DC Office, Japan Agency for Medical Research and Development (AMED)

Opening Remarks

Dr. Yuichi ONO, Professor and Deputy Director, International Research Institute of Disaster Science (IRIDeS), Tohoku University

Dr. Ono opened the session by presenting on his personal experiences conducting research on tornado warning systems internationally. Dr. Ono worked hard to be accepted into a Ph.D. program in the United States, and eventually was able to conduct research on tornados in the United States, including in Ohio, Arizona, and Mississippi. After finishing his Ph.D., he worked for the United Nations in Geneva and in Bangladesh, developing tornado warning systems. He concluded by emphasizing the importance of developing human resources to support younger generations in pursuing international research.

Dr. Ono's opening presentation

Strategic Community Building in the Fields of Science and Technology: Introduction of JST's New Initiative, "Adopting Sustainable Partnerships for Innovative Research Ecosystem (ASPIRE)

Mr. Masaki SATO, Manager, Department of International Affairs, Japan Science and Technology Agency

Mr. Sato presented on JST's Adopting Sustainable Partnerships for Innovative Research Ecosystem (ASPIRE) program, which is designed to further research cooperation among "STI advanced countries and regions" that share the same values as Japan. JST is one of the four main funding agencies in Japan, and provides funding for both curiosity-driven (bottom-up) research and top-down research according to national strategies. JST is seeking to promote researchers' global mobility, as part of the agency's efforts to foster research collaborations that can lead to innovative breakthroughs and robust research ecosystems. Researcher mobility can be facilitated through researcher exchange and knowledge exchanges between countries.

Young researchers who have been able to work overseas have noted that their experiences conducting research abroad helped them overcome foreign language barriers, learn cutting-edge trends in science and technology, and gain new research ideas. Building on its existing programs to foster international research collaborations, JST recently launched the ASPIRE program, which provides funding to young researchers from Japan that are seeking to conduct research overseas in the United States and Europe.

Through ASPIRE, JST works with foreign counterpart agencies to link researchers in Japan with those in the United States and Europe, and to provide funding for international research exchange. So far, a trial call for ASPIRE has received 43 proposals, of which 7 have been selected and funded. The funded projects are carried out jointly by lead researchers in Japan, the United States and Europe. The estimated cost of sending young Japanese researchers abroad through ASPIRE ranges between $70,000 -$110,000. The focus areas of ASPIRE are AI and information, biotechnology, energy, materials, quantum, semiconductors, and telecommunications.

The Value of Studying Abroad for Undergraduate and Graduate Students

Mr. Shun YOKOI, Ph.D. Student, Department of Physics, School of Science and Technology, Meiji University / Visiting Scholar, Structural Biology Department, School of Medicine, Stanford University-SLAC National Accelerator Laboratory

Mr. Yokoi is a Ph.D. candidate at Meiji University and a visiting scholar at the Stanford University School of Medicine. He discussed his ongoing research collaboration at Stanford University, investigating the structure of bio-molecules using X-ray differentiation and Cryo-EM imaging. He also outlined his experiences studying abroad in the United States, and stressed that studying abroad opened his eyes to other cultures and allowed him to collaborate in research with foreign scholars. Currently, Mr. Yokoi is working on a collaborative research project that investigates the process of mitochondrial fission.

There are also challenges to studying abroad, including establishing a comfortable living environment, adjusting to the language, getting medical care, and setting up an adequate

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research environment. Mr. Yokoi's study abroad experience taught him the importance of international research cooperations. Therefore, he is an advocate for the ASPIRE program, which fosters further momentum for young Japanese scholars aspiring to study abroad.

Comments

Dr. Soichi Wakatsuki, Professor, Photon Science and of Structural Biology, Stanford University-SLAC National Accelerator Laboratory

Dr. Wakatsuki began by discussing the JST Structural Life Science PRESTO (Sakigake) program, which was a JST program that promoted unique and challenging internationally high-level basic research. PRESTO was a virtual institute with 33 young PIs, as well as three PIs working outside of Japan in the United States, China, and Germany. Each PI received about $300,000 for 3.5 years. Many of the PIs have since moved onto tenured associate professor or full professor positions.

Notably, Professor Mitsutake of Meiji University was one of the PIs that participated in the program. She is now the supervisor for Mr. Shun Yokoi, who is currently a PhD candidate at Meiji University and also a visiting scholar at the Stanford University School of Medicine, which demonstrates how prior JST programs are now contributing to a new generation of researchers studying abroad.

Dr. Wakatsuki then spoke about Dr. Naoki Horikoshi, who is currently a postdoc at Waseda University, and previously worked with Dr. Wakatsuki at Stanford University-SLAC from 2017 to 2019, studying the proteins involved in blood disorders. Two JSPS research grants supported Dr. Horikoshi's work at SLAC.

Dr. Wakatsuki noted that there are many positive aspects to the US-Japan collaboration funded by JST and JSPS grants. Overseas studies are life-changing experiences, especially for younger researchers. The experiences also help young researchers to build networks, and support diversity, equity, and inclusion. While JSPS and JST exchange programs are invaluable on their own, ASPIRE further contributes to these programs through supporting mentoring for the next generation of international scholars. He suggested that the ASPIRE program might be improved by clarifying the role of the partner researchers and the overall process, and encouraged the attendees to spread the word about the program.

Dr. Soichi WAKATSUKI, Professor, Photon Science and of Structural Biology, Stanford University-SLAC National Accelerator Laboratory

Overview of NICT and JUNO

Mr. Kyotaro MAEDA, Director, North-America Center, National Institute of Information and Communications Technology

Mr. Maeda began by outlining the core functions of the National Institute of Information and Communications Technology (NICT) and then discussed its international collaboration initiatives. NICT is Japan's only public research institute specializing in information and communications technology (ICT). The institute focuses on five main research areas: advanced electromagnetic wave technology, innovative networks, cybersecurity, universal communication, and frontier science. It also provides essential public services, such as space weather forecasting and setting Japan standard time (JST). The institute has facilities all over Japan, while it also has oversea centers such as one in Washington, D.C. NICT has recently defined its four main strategic fields of NICT: Beyond 5G/6G, Quantum ICT, AI, and cybersecurity. In particular, NICT has diverse roles for Beyond 5G/6G such as a developer and provider, a funding agency, and a contributor to standards in ITU-R, 3GPP, IEEE, etc.

The Japan-US Networking Opportunity program (JUNO) is a joint collaborative research program on future networking funded and supported by NSF and NICT. The purposes of JUNO are the following.

- Accelerating the dissemination of research results from collaboration between the United States and Japan through joint publications and PoC
- Cultivating collaborative relationships between the United States and Japan as a breeding ground for future joint researches
- Fostering collaboration among young researchers such as Ph.D. students in the United States and their Japanese counterparts

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In JUNO, each project team must consist of both a US team (US universities) and a Japanese team (Japanese universities, Japanese companies, NICT). The US team submits a proposal to and is funded by NSF, while the Japanese team submits the same proposal to and is funded by NICT. Mr. Maeda concluded the presentation by describing the procedure to receive funding through JUNO.

Mr. Maeda's presentation on NICT and JUNO

JSPS Fellowship Program: Mobilizing Talents and Strengthening Ties Among Them

Information Session on Fellowships to Conduct Research in Japan

Dr. Yusaku NAKABEPPU, Director, San Francisco Office, Japan Society for the Promotion of Science

Dr. Nakabeppu presented on the Japan Society for the Promotion of Science (JSPS) fellowship program. JSPS is the largest funding agency in Japan, with a budget of approximately $2 billion, and an office in San Francisco among other international locations. JSPS offers fellowships covering airfare and living expenses for researchers at all career stages to come to work in Japan. These fellowships cover all research fields and provide an allowance for research support. The award decision primarily considers the academic value of the applicant's research plan, and applications require a host researcher. Fellowships are available to US Ph.D. candidates, postdoctoral scholars, and professors.

The different types of fellowships offered by JSPS are: short-term fellowships for pre/post docs (140 slots), standard fellowships for post-docs (330 slots), short-term fellowships for mid-career professors (130 slots), and long-term fellowships for mid-career professors (50 slots). The latter two categories are invitational. Eligibility for these various fellowships varies by the applicant's country. Moreover, the length of fellowships is flexible. The Core-to-Core program aims to build advanced research collaborations across the world. In the Core-to-Core program, JSPS's counterpart agencies are required to cover the costs of their researchers.

JSPS Fellowship Alumni Talk 1

Dr. Justin L. GARDNER, Associate Professor, Department of Psychology / Co-director, Neurosciences Interdepartmental Program, Stanford University

Dr. Gardner discussed his experiences with the JSPS fellowship program. Dr. Gardner's mother grew up in Japan and he always had a close connection to the country growing up. Before working at Stanford as a professor, Dr. Gardner conducted research in Japan for five years. The opportunity to work in Japan was made possible by a JSPS fellowship program. Dr. Gardner stressed the value of encountering scientists from other countries and sharing the joy of learning across cultural boundaries.

Dr. Gardner noted that it is also incredibly valuable to learn the different cross-cultural styles of conducting and presenting research. As a graduate student, Dr. Gardner worked in a lab and decided that he wanted to spend a summer working in Japan. Through a joint program between JSPS, JST, and NSF, Dr. Gardner was able to connect with researchers in Japan, which led to him working in a research lab. After he completed his graduate degree, he elected to go back to Japan and applied for a JSPS fellowship. Thanks to the fellowship, he was able to do a post-doc in Japan.

JSPS Fellowship Alumni Talk 2

Dr. Hirohisa A. TANAKA, Director of Research, Fundamental Physics Directorate / Professor, SLAC National Accelerator Laboratory

Dr. Tanaka, who received a JSPS fellowship in 2009, spoke about how the fellowship benefited his career. His research focuses on neutrinos, which are micro-particles that are critical for the most basic interactions in physics. After photons, neutrinos are the second most abundant particle in the universe, and have played an essential role in the evolution of the universe. Neutrino science is an area of excellence for Japan, and several Japanese researchers have won Nobel prizes in this area. In 2009, Dr. Tanaka wanted to work on a major new neutrino project, the Tokai-to-Kamioka Experiment, in Japan. Dr. Tanaka leveraged the JSPS fellowship program to make his dream become a reality.

The host professor of the experiment was Dr. Tsuyoshi Nakaya, who is a world leading scholar in neutrino science. Dr. Tanaka's JSPS fellowship started in 2009. During his time in Japan, he worked with Dr. Akihiro Minamino to integrate and prepare the detector for operations. By the end of 2009, they were able to observe neutrino interactions. This work has evolved into further developments in neutrino science and JSPS has continued to fund important scholarship in this area.

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How We Would Like to Strengthen International Research Networks

Dr. Junji URAKAWA, Director, Washington DC Office, Japan Society for the Promotion of Science

Dr. Urakawa discussed the benefits of international research collaborations and outlined the results of the JSPS fellowship program. Promoting international research networks is important because advancing complex research requires diversity of 1) research capabilities, 2) perspectives, and 3) access to resources. JSPS promotes international research networks by fostering researchers with potential international roles and supporting the globalization of Japanese universities. JSPS has several programs that aim to achieve this goal.

As it stands, 2,803 researchers came to Japan in 2022 as a result of JSPS programs. Of these researchers, 274 came from North America and 1,060 from Europe. Moreover, 2,911 Japanese researchers were able to conduct research overseas thanks to support from JSPS. Out of these researchers, 689 of them went to work in North America.

There is a large active alumni association of former JSPS fellows. There are about 31,000 researchers in this network, who support overseas research communities. The Bridge fellowship program, which is specifically for JSPS alumni, continues to link researchers internationally. The US and Canada JSPS Alumni Association, which currently has 700 members, continues to maintain and expand the network of JSPS program participants. Alumni Association members remain active by sharing their research experiences in Japan and holding seminars on research exchanges.

Collaborative Research Experiences

Dr. Fred Ariel HERNANDEZ, US National Science Foundation Postdoctoral Fellow, University of California Irvine, Department of Anthropology / Lead Scientist, University of California Los Angeles, Sport and Society Research Lab

Dr. Hernandez discussed his experience as a participant in the JSPS fellowship program. Dr. Hernandez, who was a professional badminton player, participated in a JSPS program that allowed him to complete his dissertation on sport science. Following the completion of his PhD, Dr. Hernandez spent more time in Japan, much of which was during the COVID-19 pandemic. While he was in Japan, Dr. Hernandez conducted research on the Olympic-Paralympic games in Tokyo, which was difficult due to COVID-19 restrictions. Dr. Fernandez completed the talk by discussing his remaining experiences while living and traveling in Japan.

Dr. Hernandez's presentation on his experiences with the JSPS fellowship program

Innovation in International Research Collaborations

The Importance of Research Collaborations

Dr. Patricia K. FALCONE, Deputy Director for Science and Technology, Director's Office, Lawrence Livermore National Laboratory

Dr. Falcone launched this session with an overview of Lawrence Livermore National Laboratory (LLNL), and her views on the value of scientific collaboration. LLNL, which was established in 1952, currently has roughly 8,400 employees, 521 facilities, and an annual budget of $3 billion. The laboratory contains 9 of the world's top 500 high-performing computers. LLNL is operated by the Department of Energy (DOE), which is the largest funder of research in the physical sciences, computing, and energy. DOE currently runs 17 laboratories across the United States with varying funding levels and capacities.

Dr. Falcone then discussed the value of scientific collaborations. She stressed that the best scientists deliver the best work and therefore command the most resources (i.e., funding for staff time, travel, experiments, and computation time). Outside of devoting resources to frontier science, other important funding areas are capacity building and strategic relationships building with other countries. For instance, building institutional relationships with other countries is important for meeting national strategic scientific goals. Strategic cooperation enables partners to 1) reinforce open science norms of transparency, evidence basis, peer review, and respect of property rights, 2) strengthen and deepen relationships, 3) develop the next generation of scientists, 4) leverage investments, and 5) enhance credibility.

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Dr. Falcone's presentation on the importance of research collaborations

How UC San Diego's Local Laboratory Promotes US-Japan Collaboration

Dr. Tomoko HAYASHI, Project Scientist, Moores Cancer Center, University of California San Diego

Dr. Hayashi began by introducing herself, and then discussed her research work at the Carson laboratory. Over the past 25 years, the Carson laboratory (which is part of the Moores Cancer Center) has hosted several Japanese fellows. Moreover, the lab has hosted several postdoctoral fellows since 2006, and several scholarly exchanges have occurred between Kyoto University (KU) and the University of California San Diego (UCSD), including joint symposiums. In addition, the two universities operate a joint laboratory, the KU-UCSD On-site Laboratory.

The On-site Laboratory, which consists of two facilities in Kyoto and San Diego, encourages faculty members from KU to come work at UCSD on joint research projects between the two universities. The collaboration also aims to provide more opportunities for young faculty members and researchers to gain international experience and to engage in cutting-edge research. Stakeholders in the collaboration include high-level faculty from KU and UCSD, as well as local companies in the San Diego area. Dr. Hayashi also outlined the Science and Innovation for Next Generation (SING) program, which helps Japanese life sciences researchers experience science and innovation in San Deigo through networking events and relocation assistance services. Dr. Hayashi concluded by discussing funding opportunities for international research exchange, and by emphasizing the importance of incentivizing international collaborations.

DEJIMA: How to Build International Trust over Global Innovation

Dr. Shin'ichiro MATSUO, Research Professor of Computer Science, Georgetown University

Dr. Matsuo introduced himself and his research, and then discussed the importance of computer code, noting that software has become the building block of rules in our society. He noted that Japan is still behind in the digital ecosystem. Currently, generative AI is at the forefront of technological innovation, which has prompted the White House to pressure technology firms to regulate AI technology. However, "permissionless" innovation (such as the Internet) increases the number of potential innovators and the likelihood that new technology solutions will be developed.

Decentralization and permissionless innovation can produce new services by connecting the Internet and finance. However, regulators will have a tough time enforcing regulations in this space, because digital tools require new forms of governance. There are currently debates on whether to establish global or international governance systems to better manage these tools. Moreover, international collaborations will be key to effectively leveraging blockchain technology and new innovations in computer science. Thus, it behooves researchers and policymakers in the United States and Japan to foster further research collaborations.

Building Globally Visible Research Centers in Japan

Dr. Richard B. DASHER, Adjunct Professor, East Asian Languages and Cultures / Director, US-Asia Technology Management Center, Stanford University

Dr. Dasher presented on the World Premier International Research Center Initiative (WPI-RCI), which was launched in 2007 by the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), and is administered by JSPS. The WPI-RCI is a "research excellence" program that provides major investments into areas of existing research at Japanese institutions. The average size of each research grant has recently declined to $5 million per year, and the initiative has large expectations of matching funds from host institutions. The initiative aims to help each of the participating research centers to become global research hubs, and to help them integrate into the global talent flow. The goals of the WPI-RCI are to focus on helping Japanese institutions become globalized, and to support the career development of young researchers.

Recently adopted WPI-RCI research centers include the International Institute for Integrative Sleep Medicine at Tsukuba University, the Earth-Life Science Institute at Tokyo Institute of Technology, and the Human-Biology-Microbiome-Quantum Research Center at Keio University. The WPI has always been

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very outward-thinking when it comes to seeking opportunities to foster international collaborations. The centers have produced many publications in leading scientific journals, including some that have had major impact. Of these publications, one in four collaborative papers have included international co-authors, primarily from the United States, China, United Kingdom and Germany. Thus, WPI centers represent attractive places for young international researchers.

Dr. Dasher's presentation on building globally recognized research centers in Japan

Panel Discussion

What Can We Learn from Previous Efforts to Accelerate Research Collaborations

- Dr. Richard B. DASHER, Adjunct Professor, East Asian Languages and Cultures / Director, US-Asia Technology Management Center, Stanford University
- Dr. Patricia K. FALCONE, Deputy Director for Science and Technology, Director's Office, Lawrence Livermore National Laboratory
- Dr. Shin'ichiro MATSUO, Research Professor of Computer Science, Georgetown University
- Dr. Tomoko HAYASHI, Project Scientist, Moores Cancer Center, University of California San Diego
- Moderator: Takuto MIYAMOTO, Director, Washington DC Office, Japan Agency for Medical Research and Development (AMED)

Following the previous presentations, the panelists were asked about their experiences and insights concerning research collaborations focusing on talent development and mobility between Japan and the United States, and how these collaborations can be supported and accelerated.

The moderator asked Dr. Hayashi about the enablers of her success in working as a center pole to collaborate with foreign researchers, including the ones from Japan. Dr. Hayashi emphasized the importance of maintaining day-to-day friendship and trust and noted that the timely grabbing of opportunities can lead to successful collaborations.

The moderator asked Dr. Dasher about the characteristics, strengths, weaknesses, and potential of the Japanese research community. Dr. Dasher noted that the Japanese research community could be on the verge of a "golden age." He also noted that the research world in Japan is changing and that this change is being driven by young, problem-solving researchers. Dr. Dasher also stated that more industry-academia cross-over is needed to get funding for research.

The moderator asked Dr. Falcone about the national laboratories' strategy for international cooperation. She stressed that personal and institutional relationships are critical for successful research collaborations that enrich the research results of the laboratories.

The moderator asked Dr. Matsuo how he manages his ongoing researches and pro bono activities for policymaking in Japan. Dr. Matsuo noted that the time difference can make this collaboration challenging at times, but also noted that he does the pro bono work because many globalized research areas require ongoing collaboration.

Finally, the moderator asked the panelists about the recommendations for the ASPIRE program. Dr. Hayashi emphasized the importance of funding in the partner countries and enriching the scholarship, Dr. Dasher suggested collaboration with the industries, Dr. Falcone proposed to provide extensive experiences to the research fellows, and Dr. Matsuo pointed out that policy evaluation and KPI setting are critical for the ASPIRE program.

Building Networks of Diverse and Highly Talented Researchers - Voices from the Japanese Scientists' Communities in SF Bay Area

- Dr. Ryo EGUCHI, Visiting Scholar, Department of Mechanical Engineering, Stanford University / Visiting Scholar, Department of Biosciences and Informatics, Keio University
- Dr. Muneki IKEDA, Postdoctoral Scholar, Department of Neurology, University of California, San Francisco
- Dr. Tatsuo KIDO, Assistant Professional Researcher, Division of Cell and Developmental Genetics, Department of Medicine, San Francisco VA Health Care System, University of California, San Francisco
- Dr. Marie KUBOTA, Instructor, Department of Otolaryngology–Head & Neck Surgery, Stanford University School of Medicine
- Dr. Tatsuhiro TSUKAMOTO, Postdoc, Department of Materials Science and Engineering, UC Berkeley
- Moderator: Dr. Kazuhito MORIOKA, Director, United Japanese Researchers

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Around the World / Assistant Professor, Department of Orthopaedic Surgery, University of California, San Francisco (UCSF) / Science and Technology Fellow, Overseas Diplomatic Missions of Japan

In this panel, five Japanese postdoctoral researchers from four different communities in the San Francisco bay area discussed their experiences with international collaborations as researchers abroad during the post-pandemic era. The moderator, Dr. Kazuhito Morioka, began the session by introducing himself and the United Japanese Researchers Around the World, Inc. (UJA), a global platform for Japanese researchers founded in 2012 which aims to promote the next generation of Japanese science and technology researchers and provide them with opportunities to conduct research abroad.

Dr. Morioka launched the panel discussion by asking about whether global collaboration can support Japanese researchers, resulting in strengthening the presence of Japanese science and technology. Dr. Tsukamoto stated that global collaboration allows Japanese researchers to combine their strengths in fundamental research with interdisciplinary research areas covered in the United States and elsewhere. Dr. Ikeda agreed, noting from his experiences that collaborations provide opportunities for Japanese labs to share data with United States labs. Dr. Kido noted that it is key to find the right partner, and that both parties (United States and Japan) have common goals and resources that match well for the collaboration to be a success. Similarly, Dr. Eguchi agreed that collaboration is valuable, but it can be a "gamble" for Japanese postdocs conducting research abroad, because if their fellowship doesn't provide enough achievements to publish, then they face more challenges in finding new research positions when returning to Japan. Dr. Kubota said that it is important to send more Japanese people to the United States, but it is a very high hurdle to find a position at a United States.

Dr. Morioka then asked about the environment for Japanese researchers in the United States. Dr. Tsukamoto explained that his bosses in the United States have all been very hands-off and goals-oriented, while being very supportive. Dr. Ikeda emphasized that science should be borderless so that researchers can conduct research anywhere. Dr. Kido noted that he is working in San Francisco specifically because the city has a great climate and a high quality of living. Dr. Eguchi praised the diversity of research cultures at Stanford University, which has many research exchange events such as seminars from international researchers. Dr. Kubota noted that the benefit of being in the United States is that one can have a higher budget to run certain experiments than in Japan, though the facilities and equipment are otherwise very similar between the two countries.

The final discussion topic was how the funding system for Japanese researchers could best be modified to promote global collaboration. Dr. Tsukamoto suggested that since Japan has a strong background in fundamental research, it would be good to emphasize opportunities for researchers to conduct short term research projects combining fundamental research with certain applications. Dr. Ikeda suggested that increased funding from JST's ASPIRE or other grant programs could help Japanese researchers to join high quality U.S. laboratories. Dr. Kido suggested that the funding system in Japan should expand the opportunities for work outside of Japan. Dr. Eguchi noted that costs abroad can be very high, and sometimes the fellowship amount does not provide a high enough salary on its own. He suggested that Japanese researchers abroad could share more information among each other about how to obtain more funding from additional grant programs. Dr. Kubota asked the Japanese funding agencies to encourage more Japanese people to study overseas.

Dr. Morioka concluded that 1) global collaboration has the potential to promote the presence of Japanese science and technology after the pandemic, and 2) providing the right support from funding agencies at the right time to Japanese researchers who need it is essential for their activation overseas, leading to advances in Japanese science and technology.

A panel discussion of Japanese scientists in SF Bay Area moderated by Dr. Morioka

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Day 4 Sessions

Next-generation Technologies for Micro-sampling

Expectation to Explore International Research Collaboration

Dr. Makoto ISHII, Professor, Respiratory Medicine, Nagoya University Graduate School of Medicine

Dr. Ishii introduced the session, and then proceeded to discuss the Nagoya-Stanford Cohort Study, which is a collaborative effort to better understand living environments during the COVID-19 pandemic. In the study, researchers are working with a cohort of 60 Japanese and 60 American citizens. The researchers used advanced technologies to collect data about the subjects' health. They then analyzed how the subjects' health affected COVID-19 outcomes across two cohorts. This study is an example of the future of medical research, using new technologies to elucidate the factors of individual differences in responses to health and disease.

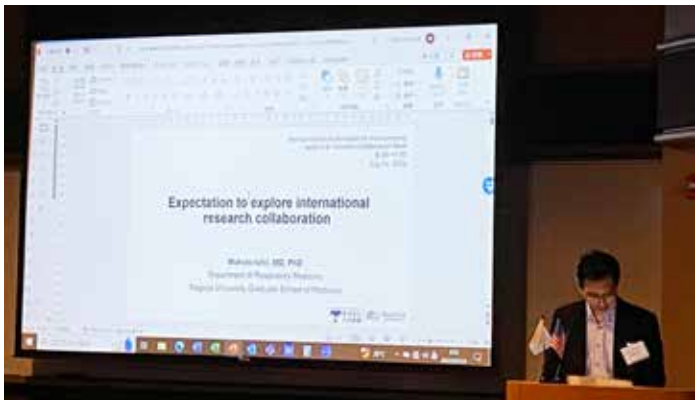
Dr. Ishii briefly summarized the conclusions drawn from the Nagoya-Stanford Cohort Study. The researchers found that health is a product of genome and exposome, which both influence the risk stratification of disease development and susceptibility to pathogens. In a study led by Nagoya University, researchers from the Japan COVID-19 Task Force collected 6,400 DNA samples to understand how genetics contribute to the severity of COVID-19 symptoms. Using the DNA data, the researchers conducted a genome-wide association study (GWAS), and found significant single nucleotide polymorphisms (SNP) on chromosome 5.

Dock 2 is a key protein that activates immune responses. Moreover, Dock 2 plays an important role in antiviral activity. The researchers hypothesized that Dock 2 gene expression is an important predictor of severe COVID cases. Indeed, the researchers found that lower levels of Dock 2 expression were associated with more severe COVID-19 illness. Specifically, they found that COVID-19 patients had reduced Dock 2 expression in monocytes. The researchers concluded that gene polymorphisms that affected gene expression were related to phenotypes of COVID-19 illness.

Dr. Ishii then introduced Nagoya University's research on early COVID-19 detection using MyPHD, a device that can be linked to one's smartphone to detect potential COVID-19 symptoms through the wearer's heart rate, skin temperature, and other metrics.

These projects, which were built through international collaboration, help to elucidate the factors behind individual differences in health and illness. Future studies, which are currently in the works, will use advanced technology to further enhance our understanding of how exposome factors influence health across race and geography.

Dr. Ishii's presentation on international research collaborations



Our Voice: Citizen Science for Health Equity

- Dr. Patricia Rodriguez ESPINOSA, Assistant Professor, Department of Epidemiology and Population Health, Stanford University School of Medicine
- Ms. Ann W. BANCHOFF, Director of Community Engagement, The Stanford Our Voice Initiative, Stanford University School of Medicine

Health equity is the state in which everyone has access to the opportunity to attain their full health potential, regardless of their social position. The citizen/community science model centers the voices of community members for improving health. The Our Voice initiative provides community members with a new way of documenting their experiences, and helps communities to use their own data to improve health outcomes in their communities, through a mobile app that allows community members to document the features of their community that affect health.

The anonymous data collected through the mobile app will be aggregated and used by the researchers and members of the community to improve health. The data will be reviewed in a group setting, and common themes will be identified, which will then be used to brainstorm ideas that can help improve community health by addressing problem areas. The data has yielded several success stories, including creating safer walking environments, improving access to senior centers, helping seniors to develop a community garden, and improving social cohesion. The initiative has also improved school route safety by engaging parents, students, teachers, and administrators. The Our Voice

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initiative currently collaborates with 30 global universities to improve community health across the world. Dr. Espinosa concluded with a discussion of emerging technologies and trends, such as natural language processing, that the initiative is studying for their potential to improve community health.

Detection of Differentially Regulated Systems behind Personalized Omics Profiling Data

Dr. Rui YAMAGUCHI, Division Chief, Division of Cancer Systems Biology, Aichi Cancer Center Research Institute

Dr. Yamaguchi's talk focused on the integration of data science and medicine. The Aichi Cancer Center Research Institute is conducting several studies involving the use of Bayesian models and deep neural-network models as statistical tools for analyzing large medical datasets. One study applies deep neural-networks to decode nucleotide sequencies from ionic currents. In another study, Dr. Yamaguchi and his team have developed an accurate Bayesian model for analyzing HLA genes from whole genome sequencing data. Another study analyzed multi-omics profiles and ctDNA time series data of colon cancer patients. The analysis has yielded useful insights for the early detection of cancer, as well as the early detection of cancer relapses.

In a Stanford-Nagoya pilot study, researchers used biological information and omics samples to analyze health outcomes and illness among patients. Another study created an integrative personal omics profile to study the progression and onset of HRV and SRV infections. Future research goals include identifying transitions from a healthy state to an unhealthy state. Wearable devices that help identify health/unhealthy states and innovations in mathematical modeling will be key to realizing this research goal.

Transforming Healthcare using Deep Data and Remote Monitoring

Dr. Michael SNYDER, Professor & Chair, Department of Genetics / Director, Center for Genomics and Personalized Medicine, Stanford University School of Medicine

Present day healthcare is fundamentally broken because it focuses on treating existing illnesses rather than preventative medicine. New technologies can help solve this problem. Modern science has discovered that health is largely a product of genome and exposome (i.e., environmental exposers and habits). Dr. Snyder's research team is using omics measurement and biosensors to extract billions of measurements from 109 individuals in order to study viral infection. A key question for this research is whether advanced measurement devices and big data can help people to better manage their health. Dr. Snyder noted that, within his sample, there were 49 major health discoveries that were picked up through wearable technologies or sequencing, providing evidence for the preventative potential of big data and technology for improving healthcare.

Furthermore, genomic sequencing on the first 70 people in the sample uncovered several pathogenic mutations associated with dangerous illnesses like colon cancer and ovarian cancer. Machine learning tools and monitoring technologies can also be used to analyze COVID-19 severity and duration. Sequencing and big data can also be used to classify individuals according to how they age. These "ageotypes" can yield insights into potential disease risk, making the data very actionable. Dr. Snyder formed a company that is aiming to market technology for multi-variate longitudinal measurements for early pre-symptomatic detection of illness. This represents the future of healthcare, as at home detection is likely to become the norm.

Future of Electronics with New Semiconductors

- Moderator: Dr. Srabanti Chowdhury, Professor, Stanford University School of Engineering

Opening Remarks

Dr. Hiroshi AMANO, Distinguished Professor and Director, Center for Integrated Research of Future Electronics, Nagoya University

Dr. Amano introduced the theme of the session: next generation materials for wide bandgap semiconductors. Currently, many technological systems are using up a lot of energy due to the use of silicon in semiconductors. Therefore, replacing silicon in microchips with new materials can prevent energy loss. Electric vehicles (EVs), for example, represent an application of efficient energy management. Toyota recently announced that it will manufacture new batteries with 10-minute charge times and longer driving ranges. Moreover, by charging and discharging, EVs can serve as movable electricity containers.

Present and Future Prospects of GaN Substrate

Dr. Kenji ISO, Manager, Mitsubishi Chemical / Designated Professor, Nagoya University

Dr. Iso presented on gallium nitride (GaN) growth technologies for semiconductors. Hydride vapor phase epitaxy (HVPE) has a very high growth rate with normal pressure. Ammonothermal GaN, on the other hand, has a low growth rate but high pressure. Therefore, ammonothermal GaN is not a good technique for mass production. Dr. Iso then presented schematics of different types of chemical GaN crystal growth technology, such as HVPE, SCAAT (Super Critical Acidic Ammonia Technology), and SCAAT-LP. SCAAT-LP has a low dislocation density, while HVPE has a high dislocation density.

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A strain-free, high crystalline quality can be achieved by using a solvothermal method in conjunction with an ammonothermal GaN solvent. The method also helps grow large crystals and is useful for mass production. The autoclave size in the quartz crystal industry has been increasing steadily. Crystals are evaluated by X-ray rocking curve methods. When this is done with SCAAT-made crystals, the results have a high quality.

Dr. Iso's presentation on the future of GaN substrate

Impacts of GaN Power Devices for Future Electric Vehicles

Dr. Tetsu KACHI, Fellow, Toyota Central R&D Labs., Inc / Designated Professor, Nagoya University

Dr. Kachi presented on GaN devices for future EVs. The electrification of automobiles is a growing strategy for reducing climate change, requiring increased efficiency of EVs. Power control units, which are a core technology for EVs, determine the performance of EVs, involving performance metrics such as maximum power, system efficiency, and drivability. These power devices have certain requirements, including high-speed switching and low resistance.

Dr. Kachi then discussed why wide bandgap semiconductor represents a superior technology for power devices, because it enables high-speed switching and low resistance. Moreover, GaN power devices are advantageous compared to silicon carbide (SiC) devices because they have high channel mobility allowing for low on-resistance. Dr. Kachi's team is working on developing a vertical GaN power device (lateral devices are already in practical use). Ion implantation is key for the GaN device functionality because it allows for expanded freedom of device design and processing. In the future, vehicles powered only by GaN technology are likely to become a reality.

Power Electronics with Emerging Semiconductors and Materials

Mr. Tim McDONALD, Senior Consulting Advisor for the CoolGaNTM Program, Infineon Technologies

Mr. McDonald discussed the role of power electronics in a sustainable world, as well as emerging technologies in the SiC and GaN technology space. He began by outlining modern power electronic technologies, including wind and solar power. The conversion of renewable energy into the grid and bidirectional flow of energy are current challenges for green power technology. Data centers are also an important component of modern energy grids.

Mr. McDonald then discussed Infineon Technologies' offerings of leading-edge silicon solutions for power devices, and use cases of emerging GaN semiconductor technologies, which include mobile chargers, solar inverters, and electric vehicles. Novel GaN technologies represent the best options for high-density and high-frequency applications. Moreover, the technology increases the range and charging capacity of EVs, increasing their efficiency. GaN technologies have the potential to save 21 billion kilowatts of electricity annually. More efficient chargers could also help customers save considerable amounts. GaN technology can also be used to increase efficiency of industrial processes, green energy technologies, and military systems.

Power Semiconductor Technologies for Modern xEV Applications

Dr. Dilip RISBUD, Director, WBG Design and Power Technology, Renesas Electronics Corporation

Dr. Risbud presented on the role of cutting-edge semiconductors in automotive applications, and the benefits of GaN technology over SiC technologies. There is currently a major shift in the automotive industry towards EV technology, since EVs are more energy efficient, require less maintenance, and require no transmission. The use of GaN technology is also growing in the automotive sector and will likely continue to grow according to forecasts.

GaN technology has important automotive applications. GaN technology in traction inverters, which convert DC voltage from the battery to a variable frequency, minimizes energy loss. GaN technologies can be used to increase efficiency in DC/DC converters, which are needed in the electric traction drive system. However, the choice between GaN and SiC semiconductors depends on the application in question, system requirements, and power density. GaN semiconductor technologies outperform SiC technology for lower applications, have a smaller size, have low switching energy losses and high frequency, and allow for higher junction temperatures. However, GaN technologies are currently behind SiC technologies in maturity, and the failure modes of GaN technology are not all known. In addition, GaN technologies

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require more reliability data, and current supply chain problems could hamper the adoption of the technology.

Why, What, and a Sample Impact on Semiconductors

Mr. Roger NICHOLS, 6G Program Manager, Keysight Technologies

Mr. Nichols presented on novel cellular communication technologies such as 5G. Modern cellular systems require considerable coordination and are very complex. Cellular technologies maintain links when in use, driving power consumption and resource demands. Compared with 4G, 5G cellular networks perform better in crowds, have higher reliability, work faster, and increase the flexibility of communication devices. Moreover, while 5G is more complicated to implement than 4G, 5G is much more effective in linking devices across various technologies.

Despite the success of 5G, 6G represents the next frontier in cellular networks. The factors driving 6G include the growth of subscriptions, the growth of mobile data consumption, the increased use of technology in industry sectors, and societal necessity (i.e., healthcare). 6G has several important use cases. For example, 6G can improve sustainable development by, for instance, automating supply chains, and can be used to create digital twins of real-world objects, such as bridges and other infrastructure. 6G also allows for the widespread use of robotics and AI, since robots rely on effective connectivity. The widespread adoption of 6G will require advanced semiconductors that operate more energy efficiently.

Displays in Consumer Electronics Status and Future Evolution

Dr. Lorenza MORO, Director, Technology Management, Samsung Display USA R&D

Dr. Moro discussed the current state of displays, trends in display technology, and challenges for display technologies. Displays are central to communication and interaction in modern life. COVID-19 further increased societal reliance on displays, leading to an explosion in the display market. Display technology has been constantly improving, allowing for better communication and new applications. Micro displays, which are used in virtual reality (VR) technology, is currently the forefront of display technology. LCD technology still dominates the overall display market, but OLEDs dominate the smartphone market. However, OLED technology could soon penetrate IT and television markets. Size, image quality, and form factor are the main drivers of display technology innovation and evolution.

Display technology applications for automobiles are increasing significantly, which is driving innovation. Improvements in high resolution, emission technology, and high refresh rates are all enabling next-generation display technology and the transition towards micro-LED displays. However, there are still challenges to widespread micro-LED adoption, such as manufacturing efficiency, and ensuring consistency in micro-LED technology. Wave guides in micro-LED are very inefficient, presenting another challenge.

Dr. Moro's presentation on the future of OLED technology in displays

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Day 5 Sessions

Fostering Global Business Growth through Industry-Academia Collaboration

Sozo's Innovation Ecosystem - Building DNA

Mr. Phil WICKHAM, Founder and General Partner, Sozo Venture

Mr. Wickham began by introducing the session's proceedings, theme, and presenters. The day's sessions are focused on unlocking the innovation potential of Japan and the United States, through tools such as venture capital, education, and commercializing university technology.

Sozo Ventures is a leading global investment and educational platform. Founded 13 years ago, Sozo Ventures has 32 employees and has a portfolio of 58 investment projects. Some of the major companies that Sozo Ventures has invested in include Zoom, Grammarly, and Palantir. Moreover, the firm has key strategic partnerships with major Japanese companies. Sozo Ventures is taking a central role in fostering education ecosystems and innovation. A key element of driving innovation is identifying existing innovators, rather than trying to turn people into innovators. Moreover, building trusted relationships and exchanging resources is central to innovation. Mr. Wickham concluded by highlighting Japan's future innovation potential.

Mr. Wickham's introductory session on unlocking Japan's innovation potential

Video Presentation

Mr. Tak NIINAMI, Chief Executive Officer, Suntory Holdings Limited

Mr. Niinami is the longest serving business leader in Japan, and is the Chairman of the Japan Association of Corporate Executives. During his tenure as CEO of Lawson, Inc., the company posted profit growth for 12 consecutive years and quadrupled its market capitalization. Mr. Niinami discussed the importance of education for unlocking Japan's innovation potential. He stated that more resources need to be invested into building a thriving collaborative education ecosystem for Japan to become a global leader in innovation.

Lessons from Unlocking the Nordics

Mr. Staffan HELGESSON, General Partner, Creandum

Mr. Helgesson discussed his experience driving innovation in Nordic countries with Creandum, which provides venture funds to early-stage entrepreneurs. Much of his inspiration for innovation came from time spent in the Bay Area. Early on, the European venture ecosystem was limited and risk averse, creating barriers to innovation. However, Creandum was able to identify young innovators and leverage their experiences from the Bay Area to provide key startup funds for unicorn firms. Mr. Helgesson's advice for Japan's innovation ecosystem is that venture firms need to be encouraged to take risks.

Identification and Development of the Scientist CEO

- Mr. Bryan ROBERTS, Partner, Venrock
- Mr. Will POLKINGHORN, Co-Founder and CEO, Need

The panelists discussed their experiences working in the venture capitalist ecosystem and how they came to work at venture firms. Moreover, they discussed how to effectively identify and support scientists who have the potential to successfully market their innovations. The key to identifying potential scientist CEOs is to talk to as many people working in science as possible, and building networks with capable scientists.

Global Leaders in Commercializing University Technology

- Moderator: Mr. Phil WICKHAM, Founder and General Partner, Sozo Ventures

Speaker 1: Dr. Mar HERSHENSON, Founding Managing Partner, Pear Venture Capital

Dr. Hershenson discussed best-practices on commercializing university technology. Dr. Hershenson is intimately involved in research at Stanford University (where she received her Ph.D.), because her firm, Pear Venture Capital, prepares and supports up-and-coming entrepreneurs to commercialize their products and become competent CEOs.

A key challenge for commercializing innovative technologies is developing a vision of how a company that commercializes a technology will look like, and how it will operate. Moreover, founders often struggle with developing such a vision and must be willing to listen to experts who understand what it takes to build a company. This is especially true for young researchers

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with an academic background. In addition, many academics with a marketable technology often struggle to sell their product. In general, academics aspiring to commercialize their technology need to be open-minded and take advice from industry experts. It can be challenging to teach certain people skills that are important to succeed in the private sector, but with proper coaching, innovators can thrive.

Dr. Hershenson and moderator Mr. Wickham, discussing how to commercialize university technology

Speaker 2: Dr. Steven N. KAPLAN, Professor, The University of Chicago Booth School of Business

Dr. Kaplan presented on venture capital (VC) investment in the United States. When selecting entrepreneurs, VC firms screen and select, provide sophisticated contracting and structuring to new businesses, and provide post-investment monitoring and feedback. Many elite companies have been fueled by VC, including Amazon, Tesla, Nvidia, Google, Microsoft, and Apple, however, fewer than 0.5% of start-ups are VC-funded. VC investment in the United States has grown steadily over the last two decades, and many countries are trying to replicate United States practices. In general, VC firms make investments by leveraging their networks and their own ideas, rather than operating reactively. Moreover, VC firms are very selective, investing on average in only 4 out of 200 firms a year. When making an investment decision, VC firms primarily consider the management team and the fit with the VC firm's target sector.

Speaker 3: Dr. Ann MIURA-KO, Co-Founding Partner, Floodgate

Dr. Miura-Ko by discussing her experiences in starting, building, and operating a company (Floodgate) that conducts risk-modeling and provides startup capital for innovative startups. Two characteristics that Floodgate values in a founder include 1) whether a founder is a "builder" who continuously creates new products and is willing to ditch untenable ideas, and 2) whether a founder is a "super-thinker" who is hungry for information and demonstrates extraordinary curiosity. These characteristics enable entrepreneurs to develop successful solutions and find markets for their products. Dr. Miura-Ko noted that the founders of Lyft and Instagram had to get rid of their original product ideas before they developed their successful technology solutions. Thus, being willing to throw out old ideas and move on is an essential quality for an entrepreneur.

Systematizing and Scaling the Magic at Stanford

- Mr. Cameron TEITELMAN, Founder and Chairman, StartX
- Moderator: Mr. Phil WICKHAM, Founder and General Partner, Sozo Ventures

Mr. Teitelman discussed why Stanford company founders have been so successful. Stanford's startups, on their own, would constitute the world's tenth largest economy as an independent nation. Stanford University has intentionally cultivated an excellent peer support network among founders and created a respected knowledge network among Stanford entrepreneurs. StartX is a non-profit community of serial entrepreneurs, industry experts, tenured Stanford professors, and well-funded growth-stage startups that aims to support cohorts of Stanford entrepreneurs. StartX typically accepts 9% of Stanford applicants, reflecting the organization's rigorous acceptance process. StartX supports founders over their entire career, creating a powerful network of successful companies. Moreover, StartX leverages software for match-making, connecting founders with key support networks. Currently, StartX is among the top 3 incubators in the world.

Mr. Teitelman (right) and moderator Mr. Wickham, discussing Stanford's innovation ecosystem

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Cross-Pollinating Ecosystems

- Ms. Ela BORENSTEIN, Vice President, Venture Capital Incentivized Programs, BDC
- Mr. Matt PRICE, Co-founder & CFO, Activate
- Mr. Paul TUMPOWSKY, Founder and CEO, Skylark

Ms. Borenstein discussed her experiences training entrepreneurs. She highlighted the importance of building an innovation ecosystem in which founders and investors have transparent conversations and discuss strengths and challenges with each other. Her organization, BDC, takes a central role in accelerating these discussions and fostering a successful venture ecosystem in Canada.

Mr. Price discussed the importance of building networks that connect young innovators. Academics tend to be excellent innovators but ineffectual businesspeople, while VC can provide the business acumen. Thus, in some respects, universities represent incubators for marketable innovations that need to be tapped into. Programs that connect VC to innovators at universities can play an important role in fostering successful startups and spinoffs.

Mr. Tumpowsky discussed his experiences working with a program that helps academic innovators to market their innovations in the private sector and work with VC. He noted that programs that support entrepreneurship at universities are in high demand now.

Discussion: Japan Tomorrow

- Dr. Joi ITO, President, Chiba Institute of Technology
- Mr. Gen WOODS, Co-Founder and CEO, Callback

Dr. Ito and Mr. Woods discussed their experiences working within the entrepreneurship ecosystem in Japan. Dr. Ito noted that Japan is currently behind other countries in digital innovation. Much of his current work focuses on helping Japanese firms work with technology entrepreneurs and providing advice to talented innovators. The Japanese government is supporting these efforts with funding and infrastructure.

Mr. Woods discussed his path to becoming a tech entrepreneur, and how he ended up living and working in Japan. He noted that Tokyo is an excellent place to be as a young entrepreneur, because the city contains a large (and growing) number of creative communities.

Discussion: Innovating a New Deep-Tech Ecosystem

- Mr. Andrew FARQUHARSON, Founding Member, InCube Ventures
- Dr. Jennifer HAMILTON, Postdoctoral Researcher, University of California Berkeley

Mr. Farquharson began the session by discussing his investment into an innovative technology with important medical implications: an ingestible pill engineered to dissolve in the stomach and inject the stomach lining using a small digestible needle. He then proceeded to discuss the innovation ecosystem that exists within California universities.

Dr. Hamilton discussed the progression of her career and how she came to study virology, as well as her experiences working with CRISPR technology to study viruses. Based on her experiences, transitioning a research project to a company can be challenging. It requires a change of mindset from a research-focused mentality to a commercialization mindset. However, it is important to not lose the scientific aspects while commercializing innovations. Investors and venture capitalists need to assist innovators in this process by providing business support and acumen.

University-Based Entrepreneurship Ecosystems: Key Success Factors and Case Examples

- Dr. Mark P. RICE, Professor of Entrepreneurship and Former Provost, Babson College
- Dr. Ade MABOGUNJE, Senior Research Engineer, Stanford University
- Dr. Kohei ITOH, President, Keio University

Dr. Rice began by discussing the concepts of idea ecosystems and venture ecosystems at universities. He stressed that idea ecosystems exist at the level of the individual firm, incubator, region, and world. VC firms are often linked to universities and cluster around universities. He then proceeded to outline the findings from a study of six university innovation ecosystems. According to the study, key success factors for the ecosystems include a vision from senior leadership, strong faculty and administrative support, a critical mass of innovation, a robust organizational infrastructure, continuing innovation, commitment to financial resources, and sustained commitment. However, sustaining a successful ecosystem is challenging, and many attempts fail. Dr. Rice then described cases in which schools successfully set up entrepreneurship ecosystem. As it stands, Babson College remains the top entrepreneurship institute in an academic setting. Babson's program features several sub-programs that support student entrepreneurs.

Dr. Mabogunje then described his views on university innovation. From an engineering perspective, innovation acts like a pendulum, swinging in and out of the university. That is, innovation can happen both inside and outside of the university. However, VC needs to be brought into the university. Moreover, there needs to be continuous dialogue between academia and industry to foster effective innovation ecosystems.

Dr. Itoh concluded the session by discussing some of the challenges to building innovation ecosystems in the Japanese

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education infrastructure. Keio University has, however, had considerable success in developing an entrepreneurship ecosystem. A key element of the university's success has been hiring people who share similar goals and visions. Moreover, Keio University's business school has moved beyond the traditional case study approach that is practiced at most business schools, and instead utilizes a unique "case method" approach.

Closing Remarks

Mr. Koichiro NAKAMURA, Founder and General Partner, Sozo Ventures

Mr. Nakamura concluded the Japan-US Collaboration Week by summarizing the main takeaways from the day's collective sessions. One takeaway is the importance of being open to learning from others. One important takeaway for Japan is that Japanese stakeholders can learn a lot from the US innovation ecosystem. Another takeaway is that Japan should not shy away from fostering success among its innovators. It is also important to effectively select innovators and to build strong human networks that allow innovators to thrive in the marketplace.

Moreover, commercializing top-tier research requires developing the best possible ecosystems for innovators. Universities will also need to take a leading role in empowering entrepreneurs. Failure is also a key component of innovation and must be encouraged and tolerated. Most ventures originally fail, and it is resilience that defines successful entrepreneurs. Once selected, startups and innovators need to be supported continuously and wholeheartedly. Another key insight is that building interconnected global networks of talent and capital can accelerate innovation. Finally, he noted that Japan's venture revolution is underway, and Japanese policymakers should strive to encourage and foster innovation ecosystems.

Appendix

Speaker Bios

July 20 (Thu)– Morning Session: ME-BYO: Social Demands and New Industrial Potential

Jeff CHEN
Professor, College of Management, Department Graduate Institute of Business Administration / College of Medicine, National Taiwan University
He holds two teaching positions at the Department and Graduate Institute of Business Administration, College of Management, and the College of Medicineof National Taiwan University (NTU). Additionally, he serves as a Visiting Professor at the BioMedical Translation Research Center of Academia Sinica, andthe Guest Professor at the Institute for Integrated Cell-Material Sciences (iCeMS) in Kyoto University Institute for Advanced Study (KUIAS).

Yotetsu HAYASHI
Chief Executive Director, Japan External Trade Organization (JETRO) San Francisco Office
He joined JETRO in 2022 after his professional work experience in the private sector, at the Japanese government, and in the world of diplomacy. His prime mission in San Francisco is to support Japanese startups who are interesting in expanding their business opportunities in the United States. He is fluent in Japanese, English and Chinese, and has a deep understanding of cultural diversity.

Paul D. HODGSON
Director of Operations, Vaccine and Infectious Disease Organization (VIDO), University of Saskatchewan
He is responsible for overall strategy, partnerships, and communications in his current role as VIDO's Director of Operations. He led investments of more than ~$150 million into VIDO in the past 5 years. His formal education includes a BSc and MSc (Pharmacology) from Dalhousie University, a PhD in Medicine from the Memorial University, and an MBA from the University of Alberta.

Yuji KUROIWA
Governor, Kanagawa Prefecture
He is promoting his "Healthcare New Frontier" policy, which combines the ME-BYO concept with state-of-the-art medical treatments and the latest technologies. He has been re-elected three times as Governor of Kanagawa Prefecture. He was a journalist, program director and anchorperson of the news program in Fuji Television Network, Inc. before taking his present role.

Lloyd B. MINOR
The Carl and Elizabeth Naumann Dean of the Stanford University School of Medicine
He is a scientist, surgeon, and academic leader. As dean, he plays an integral role in setting strategy for the clinical enterprise of Stanford Medicine, an academic medical center that includes the Stanford University School of Medicine, Stanford Health Care, and Stanford Medicine Children's Health. With his leadership, Stanford Medicine is leading the biomedical revolution in precision health.

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Takuto MIYAMOTO
Director, Washington DC Office, Japan Agency for Medical Research and Development (AMED)

Since joining the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of the Government of Japan, he has held various government posts working extensively in science, technology, education, and industry. He is also engaged with academic work on science and technology policy and has published several articles. His current research focuses on research evidence and policy processes.

Yusaku NAKABEPPU
Director, San Francisco Office, Japan Society for the Promotion of Science

He was a professor at the Division of Neurofunctional Genomics, Department of Immunobiology and Neuroscience, Medical Institute of Bioregulation, Kyushu University, before his current position. He has been exploring mechanisms protecting our genomes from damage caused by reactive oxygen species.

Toshihiko NISHIMURA
Director, Stanford Laboratory for Drug, Device Development and Regulatory Science (SLDDDRS)

He has served as the Director of SLDDDRS at the Department of Anesthesiology at the Stanford University School of Medicine since 2015. He has been recognized as one of the top leaders to build bridges among Stanford University, other academia, governments, and Industries. He has been a professor in several universities, Director at NPO, USA, and program officers and adviser in JST, AMED, and a Science Museum.

Yasushi NOGUCHI
Consul General , Consulate-General of Japan in San Francisco

He is an experienced senior diplomat in the Japanese government. After joining MOFA, he served the Japanese government mainly in diplomatic positions, including the Consulate-General of Japan in Sao Paulo, Director General for International Affairs, Bureau of Defence Policy, Ministry of Defence (MOD). He holds a Bachelor of Laws.

Ryuta NOMURA
Chairman & CEO, Central Institute for Experimental Animals

He is a CEO and Chairman of the Board of Central Institute for Experimental Animals (CIEA), which is private and indipendent institute for medical research and regulatory systems using experimental animals. He is also a visiting proffessor at Fujita Health University and President of KIngSkyFront Network Council which is one of the most active Science Zone for life science in Japan, located next to Haneda International Airport.

Ronald PEARL
Professor and Former Chair of Anesthesia Department, Stanford University School of Medicine

He is an endowed Professor at Stanford University and served as chair of the Department of Anesthesiology from 1999 to 2021. He has been recognized in the Guide to America's Top Anesthesiologists, Best Doctors in America, elected to the FAER Academy of Anesthesia Mentors, and received the Lifetime Achievement Award from the Society of Critical Care Anesthesiologists.

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Kazuyoshi SHIMADA
Director, Washington DC Office, Japan Science and Technology Agency

He has incorporated stakeholder engagement into the strategy-making and community building initiatives, with the aim of increasing the social value of the Japan Science and Technology Agency (JST). His academic background is in electronics, and in information and communication engineering

Phil WICKHAM
Founder and General Partner, Sozo Ventures

He is a veteran venture and startup entrepreneur, and a Founder and General Partner of Sozo Ventures, a leading firm for bold companies ready for global expansion. He's also the emeritus Executive Chairman of the Kauffman Fellows, where he's helping to develop the next generation of leaders in venture capital.

Ei YAMADA
President & CEO, AnGes, Inc. / President, SAMURAI Biotech Association

He has a long experience in venture companies and has a wide range of connections, including overseas collaborations. His experience began at Mitsubishi Chemical, where he served as vice president at Sosei and TakaraBio, and then became president and CEO of AnGes. He is a leading expert in gene therapy and nucleic acid medicine.

Michiyo YAMAGUCHI
Vice President, Kyoto Prefectural University

She is currently serving as Vice President and head of the International Center at Kyoto Prefectural University. Her current research interests are in World Englishes and their reception in English education. She studied at the University of Cambridge and received her M.Phil in General Linguistics in 1992. She received her PhD in English from the University of Kyoto in 2009.

July 20 (Thu) – Afternoon Session: Tracking Our Health Trajectories

Ung-il CHUNG
Executive Board Member, Vice President and Dean, School of Health Innovation, Kanagawa University of Human Services / Professor, Graduate Schools of Engineering and Medicine, The University of Tokyo

He is a Professor, The University of Tokyo Graduate School of Engineering, and Graduate School of Medicine. He also serves as Executive Board Member and Vice President at Kanagawa University of Human Services. He specializes in skeletal biology/regenerative medicine and biomaterial science. He promotes industry-academia cooperation projects to measure and visualize health status of each individual for health personalization and behavior change.

Utkan DEMIRCI
Professor, Department of Radiology, Stanford University

His group focuses on developing innovative extracellular vesicle isolation tools, point-of-care technologies and creating microfluidic platforms for early cancer detection with broad applications to multiple diseases including infertility and HIV. He is a serial academic entrepreneur founding many companies, and serves as an advisor, consultant and/or board member to some early stage companies and investment groups.

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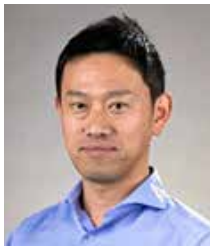
Shusaku HAYASHI
Assistant Professor, University of Toyama

He is a research member of Aihara Project of the JST's Moonshot Program Goal 2, the realization of ultra-early disease prediction and intervention by 2050. His research in the project focuses on intestinal immune-related disorders such as inflammatory bowel disease, IBD. He is now an associate professor at Kyoto Pharmaceutical University from Oct. 1st, 2023, working on to more fully and further explore the research topic he presented on the 20th in July.

Yoshiharu MATSUURA
Director, Center for Infectious Diseases Education and Research (CiDER) and Specially Appointed Professor, Research Institute for Microbial Diseases, Osaka University

He is a program manager of the JST's Moonshot Program Goal 2, the realization of ultra-early disease prediction and intervention by 2050. He was appointed Professor in Research Institute for Microbial Diseases at Osaka University in 2000 after working at NERC Institute of Virology in Oxford University as a postdoctoral fellow and at the National Institute of Infectious Disease.



Yasuo OUCHI
Assistant Professor, Department of Regenerative Medicine, Graduate School of Medicine, Chiba University / Senior Scientist, Altos Labs Inc, San Diego Institute of Science

He was awarded the JSPS Scientist for Joint International Research and initiated a collaboration with Professor Juan Carlos Izpisua Belmonte at the Salk Institute for Biological Studies in the United States In September 2022, he became a Senior Scientist at the Altos Labs, San Diego Institute of Science, where Professor Juan Carlos Izpisua Belmonte serves as the director, with a dual position at Chiba University.

Gen SOBUE
Chairperson, Aichi Medical University

He is the program director of the JST's Moonshot Program Goal 2, the realization of ultra-early disease prediction and intervention by 2050. He is a neurologist and has been involved in translational research on neurological diseases, especially motor neuron diseases, as professor and dean at Nagoya University Graduate School of Medicine. He is currently the chairperson of Aichi Medical University.

July 21 (Fri) – Morning Session: Transdisciplinary Challenges for Mental Resilience

Steven BRECKLER
Program Director, National Science Foundation (NSF)

He is a behavioral scientist with over three decades experience in research, teaching, administration, management, and science advocacy. Before joining NSF, for over ten years he was on the faculty at Johns Hopkins University, where he did research in social psychology, research methodology, and behavioral neuroscience.

Victor G. CARRION
Professor and Vice-Chair of Psychiatry and Behavioral Sciences, Stanford University School of Medicine

His multidisciplinary research on the behavioral, academic, emotional, and biological late effects of experiencing trauma has led to the development and implementation of effective new interventions for treating children who experience traumatic stress. Using PTSD as an anchor, he is investigating, through longitudinal studies, the effects of stress on developmental physiology and brain development and function.

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James GROSS
Professor of Psychology and Professor of Philosophy (by courtesy) / Director, Stanford Psychophysiology Laboratory, Stanford University
He directs the Stanford Psychophysiology Laboratory. His research focuses on emotion regulation. He is the founding President for the Society for Affective Science, the Founding Co-Editor-in-Chief of Affective Science, and is serving as a Fellow in several academic societies.

Seiji KUMAGAI
Associate Professor, Institute for the Future of Human Society, Kyoto University / Program Director, Moonshot R&D Program Goal 9
He studied Buddhist philosophy and received his Ph.D. in 2009 from Kyoto University. Since 2017, he has been a divisional director at Kokoro Research Center. His field of research is Buddhist Madhyamaka philosophy in India, Tibet and Bhutan, and also Bon religion. He has also studied the history of Tibetan and Bhutanese Buddhism.

Yasue MITSUKURA
Professor, Department of System Design Engineering, Faculty of Science and Technology, Keio University
She is focusing on medical-engineering collaborations that cannot be done by engineering alone or medicine alone, with keywords such as biological signal analysis such as EEG, neuroscience, elucidation of dementia development mechanism, gene analysis, genome editing, sleep analysis, and audio / image signal processing.

Ronald PEARL
Professor and Former Chair of Anesthesia Department, Stanford University School of Medicine
He is an endowed Professor at Stanford University and served as chair of the Department of Anesthesiology from 1999 to 2021. He has been recognized in the Guide to America's Top Anesthesiologists, Best Doctors in America, elected to the FAER Academy of Anesthesia Mentors, and received the Lifetime Achievement Award from the Society of Critical Care Anesthesiologists.

Shinichi TOKUNO
Professor, Graduate School of Health Innovation, Kanagawa University of Human Services / Project Professor, Graduate School of Engineering and Medicine, The University of Tokyo
He is a Project Professor, Department of Bioengineering, The University of Tokyo Graduate Schools of Engineering and Medicine. He worked as an associate professor at National Defense Medical College and a project associate professor of verbal analysis of pathophysiology at Graduate School of Medicine at the University of Tokyo.

July 21 (Fri) – Afternoon Session: How Have We Worked Against COVID-19?

David CORMAN
Program Director, National Science Foundation (NSF)
He is leading Cyber Physical Systems (CPS), Smart and Connected Communities (S&CC), and CIVIC Innovation Challenge Programs for the National Science Foundation. He previously worked for McDonnell Douglas / Boeing. He obtained a PhD in Electrical Engineering with a major in controls and a minor in communications and applied mechanics.

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Darryl FALZARANO
Research Scientist, Vaccine and Infectious Disease Organization (VIDO), University of Saskatchewan

His lab is focused on developing animal models and vaccines for coronaviruses. An alpaca model was established to allow multiple vaccine candidates MERS-CoV to be evaluated – these vaccines are targeted for use in dromedary camels. VIDO develops vaccines for both humans and agricultural animals and is home to the International Vaccine Centre.

Hiroyuki KATAYAMA
Professor, Department of Urban Engineering, School of Engineering, The University of Tokyo

He has been interested in health-related water microbiology focusing on virus detection, water/wastewater treatment and risk management. He has conducted research on the development of virus concentration methods, disinfection and surveys on the occurrence of viruses in water in Japan and in Southeast Asian countries.

Ramasamy PAULMURUGAN
Professor of Radiology, Stanford University School of Medicine

He is a pioneer in developing split-reporter protein complementation systems for different reporter genes and has been using the system for imaging cellular protein-protein interactions in living animals. His research interest is imaging cellular signal transduction networks in living animals and developing a novel gene therapy for different cancers.

Ronald PEARL
Professor and Former Chair of Anesthesia Department, Stanford University School of Medicine

He is an endowed Professor at Stanford University and served as chair of the Department of Anesthesiology from 1999 to 2021. He has been recognized in the Guide to America's Top Anesthesiologists, Best Doctors in America, elected to the FAER Academy of Anesthesia Mentors, and received the Lifetime Achievement Award from the Society of Critical Care Anesthesiologists.

Steven SHAFER
Professor, Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine

His professional interests are data modeling, the clinical pharmacology of intravenous anesthetic drugs, and publication policy and ethics. His work in pharmacology includes studies of many of the intravenous opioids and hypnotics used in anesthetic practice. His focus has been mathematical models that characterize drug behavior. He has been modeling the COVID-19 pandemic.

Hideki UENO
Professor, Department of Immunology, Graduate School of Medicine, Kyoto University

He is the Director of Kyoto University Immunomonitoring Center developed in 2022, and is a Vice-Director of ASHBi, Kyoto University since 2023. Since 2022, he is the Adjunct Professor, Department of Pediatrics, University of California San Diego. He graduated from Kyoto University and obtained Ph.D. at Graduate School of Medicine, Kyoto University in 2001.

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July 22 (Sat) - Building Networks of Diverse and Highly Talented Researchers

Richard B. DASHER

Adjunct Professor, East Asian Languages and Cultures / Director, US-Asia Technology Management Center, Stanford University

His research focuses on the impact of new technologies on industry value chains, innovation management, and regional innovation ecosystems in different countries. He has served on the Program Committee of Japan's World Premier International Research Center Initiative (WPI). He is dedicating his private consulting time to be a partner with the VC firm Global Hands-On Venture Capital (GHOVC).

Ryo EGUCHI

Visiting Scholar, Department of Mechanical Engineering, Stanford University / Visiting Scholar, Department of Biosciences and Informatics, Keio University

He is working at Collaborative Haptics and Robotics in Medicine Lab at Stanford University. His research interest is the ubiquitous intelligent measurement and sensory feedback systems for human performance design, wearable haptic devices for human motion guidance, navigation, and control, and ubiquitous sensor systems for human motion sensing using multi-sensor fusion and machine learning.

Patricia K. FALCONE

Deputy Director for Science and Technology, Director's Office, Lawrence Livermore National Laboratory

She is the principal advocate for theLawrence Livermore National Laboratory (LLNL)'s science and technology base and oversees the strategic development of the Lab's capabilities. She served for six years at the White House Office of Science and Technology Policy before joining LLNL. She earned her Ph.D. degree in mechanical engineering from Stanford University.

Justin L. GARDNER

Associate Professor, Department of Psychology / Co-director, Neurosciences Interdepartmental Program, Stanford University

He is currently a tenured Associate Professor in the Department of Psychology at Stanford University and the Co-director of the Neurosciences Interdepartmental Program at Stanford University. He received his Bachelor of Science in Computer Science from Yale University in 1993. He was a Graduate Student in Stephen G. Lisberger's lab at the UC Berkeley and at UCSF while working on his PhD in Bioengineering.

Tomoko HAYASHI

Project Scientist, Moores Cancer Center, University of California San Diego

Her research career has been dedicated to the study of host immune responses towards cancer, microbial infectious diseases and the involvement of microbial components in the pathology of autoimmune diseases. Recently, her research has focused on the characterization of Toll-like receptor ligands, its derivatives, and the investigation of clinical applications for these ligands in cancer and immunologic disorders.

Fred Ariel HERNANDEZ

US National Science Foundation Postdoctoral Fellow, University of California Irvine, Department of Anthropology / Lead Scientist, University of California Los Angeles, Sport and Society Research Lab

He discussed his collaborative research experience in Japan as a JSPS postdoctoral fellow. While finishing his dissertation, he began his collaborations with Japanese based researchers during a JSPS summer fellowship in 2017. He nurtured those collaborations in scope in 2020-2021, and continues to the present. He related some of his research experiences while in Japan, including the disruption of COVID-19 and the postponement of the Tokyo Olympic Games. Prior to academia, he was a professional badminton player for Puerto Rico.

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Muneki IKEDA
Postdoctoral Scholar, Department of Neurology, University of California, San Francisco

He has been doing neurological research with interest in the brain and consciousness. In his recent research, he modeled the neural circuits of the C. elegans, and succeeded in explaining the processing within a population of neurons by exploring the parameters of the strength of the connections between neurons, associated with the behavior, using machine learning.

Tatsuo KIDO
Assistant Professional Researcher, Division of Cell and Developmental Genetics, Department of Medicine, San Francisco VA Health Care System, University of California, San Francisco

He is an experienced investigator in molecular genetics and transgenic mouse modeling of human diseases. His primary research interest lies in understanding the mechanisms that cause sex differences in various human diseases, including but not limited to cancer, cardiovascular diseases, and neurodegenerative diseases.

Marie KUBOTA
Instructor, Department of Otolaryngology–Head & Neck Surgery, Stanford University School of Medicine

She received her Doctor of Medicine at Kyushu University. After her residency in Otolaryngology, she pursued a Ph.D. program in Virology and received her Ph.D. from the Graduate School of Medical Sciences, Kyushu University. In 2017, she joined an inner ear research lab in Stanford. Her research focus is on the regeneration of inner ear sensory cells and on the molecular mechanism of viral deafness.

Kyotaro MAEDA
Director, North-America Center, National Institute of Information and Communications Technology

He received his Bachelor's in Economics from the University of Tokyo in 2004 and his Master's in Applied Economics from the University of Michigan in 2012. He is also a Certified Public Accountant in Washington State (2013-). His main responsibility is market and policy research in ICT issues such as 5G/Beyond 5G, Quantum ICT, AI, and cybersecurity. He was a government official at the Ministry of Internal Affairs and Communications in Japan (2004-2021).

Shin'ichiro MATSUO
Research Professor of Computer Science, Georgetown University

He is a research scientist in cryptography and information security. He is working on maturing blockchain technology from the academia side and presents research results on blockchain security. At Georgetown University, he is co-directing the CyberSMART research center and leads multi-disciplinary research among technology, economy, law, and regulation.

Takuto MIYAMOTO
Director, Washington DC Office, Japan Agency for Medical Research and Development (AMED)

Since joining the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of the Government of Japan, he has held various government posts working extensively in science, technology, education, and industry. He is also engaged with academic work on science and technology policy and has published several articles. His current research focuses on research evidence and policy processes.

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Kazuhito MORIOKA

Director, United Japanese Researchers Around the World / Assistant Professor, Department of Orthopaedic Surgery, University of California, San Francisco (UCSF) / Science and Technology Fellow, Overseas Diplomatic Missions of Japan

He is currently an Assistant Professor at the Orthopaedic Trauma Institute (OTI), the Department of Orthopaedic Surgery, UCSF, and the Director of United Japanese Researchers Around the World (UJA) after local community management. He received his Doctor of Medicine from Jikei University. Following his clinical work at the University of Tokyo Hospital, he became a Japanese board-certified orthopaedic surgeon and engaged in neuroscience.

Yusaku NAKABEPPU

Director, San Francisco Office, Japan Society for the Promotion of Science

He was a professor at the Division of Neurofunctional Genomics, Department of Immunobiology and Neuroscience, Medical Institute of Bioregulation, Kyushu University, before his current position. He has been exploring mechanisms protecting our genomes from damage caused by reactive oxygen specie.

Yuichi ONO

Professor and Deputy Director, International Research Institute of Disaster Science (IRIDeS), Tohoku University

He came back to Japan after the Great East Japan Earthquake. He is also a Representative Director of the World Bosai Forum Foundation. He received his Ph. D. in Geography from Kent State University. He worked for the United Nations in policy making in disaster risk reduction, including WMO, UNISDR, and ESCAP

Masaki SATO

Manager, Department of International Affairs, Japan Science and Technology Agency

He has worked for the scientific and technological information division, International Science and Technology Center, JST Singapore office and the department of international affairs during his tenure at JST. Prior to joining JST, he worked at NEC Telecom System Ltd. where he was mostly in charge of integrated circuit design for telecommunication equipment.

Kazuyoshi SHIMADA

Director, Washington DC Office, Japan Science and Technology Agency

He has incorporated stakeholder engagement into the strategy-making and community building initiatives, with the aim of increasing the social value of the Japan Science and Technology Agency (JST). His academic background is in electronics, and in information and communication engineering

Hirohisa A. TANAKA

Director of Research, Fundamental Physics Directorate / Professor, SLAC National Accelerator Laboratory

He is currently Technical Coordinator for the Deep Underground Neutrino Experiment's Near Detector. He received his Bachelors of Arts in Physics and Mathematics from Harvard University. He received his PhD in Physics from Stanford University. He worked at Princeton University University of British Columbia, and was a Professor at the University of Toronto before becoming a Professor at SLAC, and Stanford.

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Tatsuhiro TSUKAMOTO
Postdoc, Department of Materials Science and Engineering, UC Berkeley

He received his Ph.D. at the University of Chicago on the precise chemical synthesis of nanographene materials. He joined the team of Dr. Roy G. Gordon and Dr. Michael J. Aziz's research groups at Harvard University on the development of redox-active organic molecules for aqueous redox flow batteries and carbon capture. In 2023, he joined his present team and works on energy storage using aqueous redox flow batteries.

Junji URAKAWA
Director, Washington DC Office, Japan Society for the Promotion of Science

He is working to support Japan-US research collaboration. He obtained a Doctorate of Engineering in Nuclear Physics from the Tokyo Institute of Technology. He worked for Heavy Ion Linac in Riken, Accelerator Laboratory in KEK, and the Graduate University for Advanced Studies (Sokendai). He is a KEK Diamond Fellow.

Soichi WAKATSUKI
Professor, Photon Science and Structural Biology, Stanford University-SLAC National Accelerator Laboratory

He recently initiated the Biosciences Division at Photon Science Directorate at SLAC National Accelerator Laboratory. His research interests include structural biology of post-translational modification and vesicle transport, structural biology of polyubiquitin recognition, synchrotron radiation and XFEL instrumentation, protein crystallography and small angle X-ray scattering, integrative multi-scale bioimaging.

Shun YOKOI
Ph.D. Student, Department of Physics, School of Science and Technology, Meiji University / Visiting Scholar, Structural Biology Department, School of Medicine, Stanford University-SLAC National Accelerator Laboratory

He is pursuing a Ph.D in Physics at Meiji University. He received the 14th TOBITATE! Young Ambassador Program Fellowship, led by Japan's Ministry of Education, Culture, Sports, Science, and Technology. He began his research in February 2022 at the Structural Biology Department, School of Medicine, Stanford University-SLAC National Accelerator Laboratory as a visiting scholar

July 24 (Mon) – Morning Session: Next-generation Technologies for Micro-sampling

Ann W. BANCHOFF
Director of Community Engagement, The Stanford Our Voice Initiative, Stanford University School of Medicine

She is MSW, MPH and has a background in public health, social work, and international human rights, as well as broad experience in developing and sustaining community-academic partnerships. She has worked extensively with migrants and other underserved populations in the California Bay Area and in Oaxaca, Mexico, and has also lived and worked in Russia, France, Ethiopia, and Peru.

Patricia Rodriguez ESPINOSA
Assistant Professor, Department of Epidemiology and Population Health, Stanford University School of Medicine

She is a PhD., MPH, and a native of Habana, Cuba, and a clinical psychologist by training. The ultimate goal of her research is to decrease health inequities among racial/ethnic minority populations, particularly Latinxs and immigrant communities, through transdisciplinary and community-engaged scholarship. Her research aims to understand factors that create and maintain health inequities.

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Makoto ISHII

Professor, Respiratory Medicine, Nagoya University Graduate School of Medicine

His research interests are respiratory infection, infection immunology, respiratory regeneration, and epigenetics. Before his present position, he was a medical doctor and medical scientist at University of Michigan and Keio University in the field of Life science and Respiratory medicine, especially in the fields of Respiratory infectious diseases and Respiratory regeneration

Michael SNYDER

Professor & Chair, Department of Genetics / Director, Center for Genomics and Personalized Medicine, Stanford University School of Medicine

He is currently Dean of the Graduate School of Genetics, Stanford University School of Medicine, and Director of the University's Center for Genomics and Personalized Medicine. He received his Ph.D. of Chemistry and Biology from California Institute of Technology in 1982. He was assigned to his current position after working at Stanford University and Yale University.

Rui YAMAGUCHI

Division Chief, Division of Cancer Systems Biology, Aichi Cancer Center Research Institute

He is currently the Division Chief, Division of Cancer Systems Biology, at the Aichi Cancer Center Research Institute. He is also an affiliate professor (Department of Cancer Systems Informatics), Nagoya University Graduate School of Medicine. He received his doctor degree (Doctor of Science) from Kyushu University. He served for the Institute of Statistical Mathematics, Graduate School of Mathematics, Kyushu University, and Human Genome Center, Institute of Medical Science, University of Tokyo.

July 24 (Mon) – Afternoon Session: Future of Electronics with New Semiconductors

Hiroshi AMANO

Distinguished Professor and Director, Center for Integrated Research of Future Electronics, Nagoya University

He leads the world in the creation of high-performance DUV LEDs, LDs, RF and power devices. He succeeded in growing the first conductive p-type GaN and in fabricating p-n-junction GaN-based UV and blue LEDs for the first time in the world. His group succeeded in creating the world's shortest wavelength laser diode emitting 271.8 nm, and room temperature continuous wave operation of 274 nm laser diode. He is a Nobel Laureate in Physics in 2014.

Srabanti CHOWDHURY

Professor, Stanford University School of Engineering

Her research focuses on wideband gap (WBG) and ultra-wide bandgap (UWBG) materials and device engineering for energy efficient and compact system architecture for power electronics, and RF applications. Besides GaN, her group is exploring diamonds for various active and passive electronic applications, particularly thermal management.

Kenji ISO

Manager, Mitsubishi Chemical / Designated Professor, Nagoya University

He studied LEDs and LDs on nonpolar GaN substrate at UC Santa Barbara. He started his R&D work on GaN bulk crystal growth by hydride vapor phase epitaxy when he joined Mitsubishi Chemical corporation. He has extensive experience in GaN bulk growth and CdTe growth by vapor phase epitaxy, GaN self-standing substrate fabrication, GaN optical device, and GaN-on-GaN electronic device.

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Tetsu KACHI
Fellow, Toyota Central R&D Labs., Inc / Designated Professor, Nagoya University

He studied the optical measurement systems, GaAs lasers, GaN lasers and GaN light emitting diodes at Toyota Central R&D Labs., Inc. His main interest has been in vertical GaN power devices for electric vehicle applications. He has served as the leader of the national project and continues to lead the GaN power device group at Nagoya University.

Tim MCDONALD
Senior Consulting Advisor for the CoolGaNTM Program, Infineon Technologies

He has over 40 years of diversified experience in power conversion/management and has held senior level positions in device engineering management, product and market development, product engineering, device characterization, test platform development and operations. He chairs several expert committees.

Lorenza MORO
Director, Technology Management, Samsung Display USA R&D

She has a long experience and expertise on electronic materials and devices. For the last several years she has been working on flexible displays, specifically on encapsulation of OLED displays like those used on Samsung Galaxy and Apple iPhones. Most of her current activity is on microdisplay and optics for AR/VR. She graduated in Physics from the University of Padua.

Roger NICHOLS
6G Program Manager, Keysight Technologies

He is an acknowledged subject matter expert in mobile wireless communications design and measurement technologies. He has 39 years of engineering and management experience at Hewlett-Packard, Agilent, and Keysight spanning roles in R&D, marketing, and manufacturing. With experience in mobile wireless technology on all five previous generations, he has been directing Keysight's 6G program since its inception in 2019.

Dilip RISBUD
Director, WBG Device Design and Development, Renesas Electronics Corporation

He leads product development for all HV power semiconductors (SiC and GaN) and is actively involved in technology development. His team includes design experts and R&D professionals from across the globe. As a technologist, he is instrumental in setting the WBG strategy, products and technology roadmaps for Renesas and advises the top management on key decisions.

July 25 (Tue): Fostering Global Business Growth through Industry-Academia Collaboration

Ela BORENSTEIN
Vice President, Venture Capital Incentivized Programs, BDC

She brings risk capital to promising healthcare and life sciences companies, contributing to the growth and innovation of the sector as the Managing Partner of a $135M fund, leveraging over 20 years of experience in drug and medtech development. Her experience as a Kauffman Fellow has directly influenced and contributed to her current activities and responsibilities related to venture capital incentivized programs.

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Andrew FARQUHARSON
Founding Member, InCube Ventures

He is a seasoned investor and entrepreneur specializing in life-science companies, with a focus on biotechnology and medtech, and a particular interest in CRISPR-enabled innovations. He holds an MBA from Harvard University and a Bachelor's degree with high honors from the University of California at Berkeley.

Jennifer HAMILTON
Postdoctoral Researcher, University of California Berkeley

Her research is dedicated to expanding the therapeutic applications of genome engineering, specifically focusing on engineering enveloped particles to deliver CRISPR-based genome editing tools. Her expertise in virology is utilized to target genome-editing molecules directly to disease-relevant cell types, aiming to pave the way for precise, effective, safe, and accessible genomic-based therapies.

Staffan HELGESSON
General Partner, Creandum

He specializes in consumer marketplaces and enterprise software, with a particular emphasis on facilitating the expansion of Creandum's portfolio companies into the US market. An avid supporter of the European tech ecosystem, he regularly engages in discussions related to entrepreneurship on all levels and has been in the venture industry for more than 2 decades. He is a distinguished member of the first-ever international Kauffman Fellows class in 2005.

Mar HERSHENSON
Founding Managing Partner, Pear Venture Capital

She has been recognized in the Midas List of Top Tech Investors in 2021, 2022, and 2023. After earning a Ph.D. in Electrical Engineering from Stanford University, she developed a groundbreaking technique of opimizing the design of analog semiconductors. Since then, she has accrued over 13 years of founder experience, co-founding three startups in mobile/ecommerce, enterprise software and semiconductor industries.

Joi ITO
President, Chiba Institute of Technology

He is a versatile leader, currently serving as the President of Chiba Institute of Technology, Director of gmjp, and Co-Founder of Digital Garage. With a focus on the ethics and governance of technology, he is a venture capitalist, entrepreneur, writer, and scholar. Previously, he held the position of director at the MIT Media Lab and has been a notable figure on boards of organizations like PureTech Health, Creative Commons, The New York Times Company, and others.

Kohei ITOH
President, Keio University

He is the President of Keio University, having joined as a faculty member in 1995 and later becoming a full professor in 2007. His primary research focus is on quantum computing, quantum sensing, and quantum physics, and he plays a leading role in various quantum information projects in Japan, serving as the Program Director in the MEXT Quantum Leap Flagship Program and the Chairperson for the expert panel on Quantum Technology Innovation for the government of Japan.

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Steven Neil KAPLAN
Professor, The University of Chicago Booth School of Business

He conducts research on private equity, venture capital, entrepreneurial finance, corporate governance and corporate finance. He is the co-creator of the Kaplan-Schoar PME private equity benchmarking approach. He co-founded the entrepreneurship program at Booth. He received his AB, summa cum laude, in Applied Mathematics and Economics from Harvard College and earned a Ph.D. in Business Economics from Harvard University.

Ann MIURA-KO
Co-founding Partner, Floodgate

She is a repeat member of the Forbes Midas List and the New York Times Top 20 Venture Capitalists Worldwide. She is well-kown in Silicon Valley as a pioneer investor in the pre-seed and seed stage companies because of her background as a Ph.D. in math modeling of infosec at Stanford. She is also serving in academia as a lecturer in entrepreneurship at Stanford, a co-director of the Mayield Fellows Program at Stanford, and a member of the Board of Trustees for Yale University.

Ade MABOGUNJE
Senior Research Engineer, Stanford University

He is a scientist at Stanford University's Center for Design Research, focusing on the intersection of designing, learning, engineering, capital formation, and innovation. He conducts empirical studies using Immersive Virtual Reality and Computer Simulation to identify performance metrics within design teams, aiming to guide the development of practices that accelerate innovation and capital formation.

Koichiro NAKAMURA
Founder and General Partner, Sozo Ventures

He earned a spot on the 2021 Forbes Midas List for investments in Coinbase, Palantir, and leading Sozo's investment in Square. With over two decades of experience building technology companies, including his role as a founding team member of Yahoo! Japan, He has played a crucial role in fostering relationships at Mitsubishi Corporation, creating Japan's first Application Service Provider, and launching the Innovation Kitchen, incubating seed-stage ventures in Japan.

Tak NIINAMI
Chief Executive Officer, Suntory Holdings Limited

He is the longest serving business leader in Japan, serving under former Prime Ministers Abe and Suga, and the incumbent Prime Minister Kishida. He is the Chairman of the Japan Association of Corporate Executives. During his tenure as CEO of Lawson, Inc., the company posted profit growth for 12 consecutive years and quadrupled its market capitalization. He received his MBA with distinction from Harvard Business School.

Will POLKINGHORN
Co-Founder and CEO, Need

He leads a Venrock-funded global health tech company building the world's first cancer protection system that enables anyone to achieve the best possible cancer outcome. In partnership with leading insurers, he builds next-generation, holistic cancer protection solutions that combine financial protection with an end-to-end technology-enabled service. He completed his clinical training at Massachusetts General Hospital and Memorial Sloan Kettering Cancer Center.

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Matt PRICE
Co-founder and CFO, Activate

He is the Co-founder and CFO of Activate, a company that empowers scientists to address climate change by bringing their research to market through its fellowship program. He received his MBA from the Haas School of Business, UC Berkeley, where he co-founded the Berkeley Energy Resource Collaborative (BERC), and holds a B.S. in Materials Science and Engineering from Northwestern University.

Mark P. RICE
Professor of Entrepreneurship and Former Provost, Babson College

He has been actively involved in shaping university-based entrepreneurship ecosystems for the past three decades, contributing significantly at institutions like RPI, Babson College, and WPI. His global impact extends to delivering training programs for entrepreneurship educators and program managers across Asia, South America, and North America. He holds degrees in Mechanical Engineering and a Ph.D. in Management from Rensselaer Polytechnic Institute.

Bryan ROBERTS
Partner, Venrock

He is based in Palo Alto and collaborates with early-stage entrepreneurs driving innovation across the healthcare and life sciences sectors. He is currently involved with several companies across therapeutics, genomics, and health tech. Prior to joining Venrock, Mr. Roberts earned his Ph.D. in Chemistry & Chemical Biology from Harvard University.

Yoshitsugu SHITAKA
Chief Scientific Officer, Astellas Pharma Inc.

He has held scientific, management, and executive positions in Astellas in the fields of New Product Science Strategy, Product & Portfolio Strategy, Therapeutics, Frontier Disease Research, Drug Discovery and Neuroscience. He was a Visiting Scientist at Washington University School of Medicine in St. Louis. He received his B.Sc., M.Sc., and Ph.D. in Pharmaceutical Sciences from the University of Tokyo.

Cameron TEITELMAN
Founder and Chairman, StartX

StartX is a non-profit community of Stanford's highest potential alumni and student entrepreneurs and runs a startup accelerator that is ranked top 3 in the world on outcomes. Through StartX, he has helped launch over 1000 companies, with 17 worth over $1B, several hundred worth over $100M and are valued at over $70B with over $25B of venture capital raised. He graduated from Stanford University in 2011 with an engineering degree in Management Science and Engineering.

Paul TUMPOWSKY
Founder and CEO, SKYLARK

He has devoted decades to advising and nurturing early-stage businesses. With an MBA from Columbia Business School and a BS in Mechanical Engineering from the University of Illinois, his academic foundation is complemented by teaching roles, including instructing Idea to IPO at the New York Academy of Sciences and guest lectures at Columbia University.

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Phil WICKHAM
Founder and General Partner, Sozo Ventures

He is a veteran venture and startup entrepreneur, and a Founder and General Partner of Sozo Ventures, a leading firm for bold companies ready for global expansion. He's also the emeritus Executive Chairman of the Kauffman Fellows, where he's helping to develop the next generation of leaders in venture capital.

Gen WOODS
Co-founder and CEO, Callback

He is co-founder and CEO of Tokyo-based startup Callback, a one-stop platform for NFT communities. As a Stanford graduate from the class of 2020 with a major in Management Science and Engineering (MS&E), he combines entrepreneurial vision with technological expertise to drive innovation in the NFT landscape.

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Additional Photos

Photos from the reception and other special moments during the week.

Materials for Attendees

Attendees during a Break

The Next Generation of Researchers

Participants in Saturday's Session

Discussion to Develop on-going Collaboration

Looking forward to Future Collaborations!

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Reception Group Photo

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