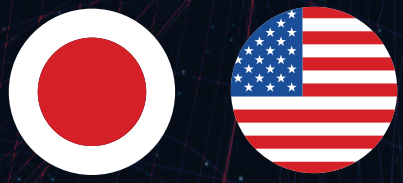


JAPAN-US

RESEARCH COLLABORATION WEEK

2024

Creating the Japan-US Research Highway

Table of Contents

Welcome

Introduction

The Japan-US Research Collaboration Week 2024 was held on July 29-31, 2024 at Stanford, California.

This symposium is jointly hosted by Stanford University School of Medicine and Japan Science and Technology Agency, and co-organized and supported by Consulate-General of Japan in San Francisco, Japan Agency for Medical Research and Development (AMED), Japan External Trade Organization (JETRO), Japan Society for the Promotion of Science (JSPS), Nagoya University, National Institute of Information and Communications Technology (NICT), The University of North Carolina at Chapel Hill, United Japanese researchers Around the world (UJA) and World Bosai Forum Foundation.

The Japan-US Research Collaboration Week aims to provide a platform for Japanese and U.S. universities, research institutes, businesses, and financial institutions to cooperate in creating joint research projects and contributing to science and technology diplomacy between Japan and the US. Additionally, it seeks to facilitate the social implementation of science and technology research results through business. This cooperation will result in societal and economic growth that is centered around human needs, sustainable, healthy, and equitable.

It is a unique opportunity for various stakeholders who are currently engaged in collaborations or who wish to establish new collaborations in the future to discuss how to develop collaborations, identify potential collaborators, and learn from the experience of existing collaborative activities. This will provide insight into the **“research highway”** that is being developed as a mechanism to accelerate research collaboration between Japan and the US, and to link research results to social implementation and commercialization.

Agenda

July 29 Monday

08:30-10:30 Opening Plenary

11:00-13:30 Gene Therapy from Platform to Today

14:00-18:30 World Bosai Forum @ Silicon Valley 2024

16:00-18:00 Promoting Global Health Advancements through Innovative Technology

July 30 Tuesday

08:30-10:30 The Future of Space Telecommunications

11:00-13:00 The Three Pillars of Pandemic Preparedness

13:15-15:45 Transdisciplinary Challenges for Mental Resilience

13:30-15:30 Creating Core Research Community and Fostering Talent Mobility for Promoting Japan-US S&T Collaboration

16:00-19:00 Energy and Materials for Sustainable Society

July 31 Wednesday

09:00-12:00 Deep-tech Start-up Ecosystem: Breakout Sessions

Breakout Session1; Biotech, Healthtech, and Agetech (ME-BYO)
Breakout Session 2; SaaS, Robotech, and Healthtech (2)
Breakout Session 3; Agetech, Healthtech, Disaster Preparedness, and AI

11:00-13:30 Deep-tech Start-up Ecosystem: Plenary Discussion

July 29 Monday, 8:30 - 10:30

Opening Plenary

The symposium began with welcome and congratulatory remarks from seven distinguished speakers.

Dean Minor from Stanford University School of Medicine began by welcoming the participants and guests to Stanford University. He emphasized that a core central element of JURC is the shared vision in addressing the complex global challenges, along with a mutual recognition of the critical role of multidisciplinary research. He expressed his gratitude to the various partners who contributed to organizing the event. He concluded his remarks by expressing his hope that the gathering would be productive and energizing.

Prof. Pearl from Anesthesia Department, Stanford University School of Medicine emphasized that collaboration is not only important for advancing discovery, but also for translating those discoveries into action that improve health happiness and prosperity of our countries. He welcomed the fact that the symposium has expanded beyond cooperation in the medical field to encompass a broader range of topics this year. He expressed hope that participants will benefit from the symposium as a platform for education, networking, and building new collaborations.

Prof. Amano from Nagoya University highlighted that from an engineer‘s perspective, sensors play a crucial role, not only in monitoring human health, but also in monitoring the Earth. He emphasized that reducing CO_2 emissions is an urgent issue, and while expanding the use of renewable energy is important, managing electricity generated from renewable energy sources poses significant challenges from an engineering standpoint. He expressed his hope that JURC will contribute to the establishment of a net-zero carbon emission society.

Mr. Osumi from Consulate-General of Japan in San Francisco underscored the importance of international cooperation in science and technology, emphasizing the event‘s goal to foster collaborations that drive global scientific advancements, improving the quality of life worldwide. He highlighted the broad range of topics to be discussed at the conference, from health sciences to disaster management. Additionally, Mr. Osumi mentioned Japan‘s recent earthquake and California’s earthquake preparedness efforts, stressing the pivotal role of scientific research

Inspiring Collaborations for Global Progress.

in shaping public policy and improving disaster readiness.

Governor Kuroiwa of Kanagawa Prefecture congratulated the organizers of JURC2024 and highlighted the ongoing collaboration between Kanagawa Prefecture and Stanford University School of Medicine which has been in place since 2016. He introduced Kanagawa's Healthcare New Frontier Policy, which aims to realize healthy longevity as well as creating new industries and markets in order to challenge the super-aged society. The policy is based on the health concept called "ME-BYO", which refers to the transitional state between health and sickness. Additionally, he presented the vision of society where everyone possesses "Vibrant INOCHI" with the ultimate goal, of enabling people to live a 100-year life full of vitality, laughter and fulfillment.

Mr. Nomura from Central Institute for Experimental Medicine and Life Science highlighted the long-standing cooperation between his organization and Stanford, congratulating JURC on the expansion of its activities. He expressed hope that these efforts will continue to grow in the future. He further noted that his organization changed its name this year reflecting its renewed commitment to advancing human health.

Mr. Hayashi from Japan External Trade Organization (JETRO) San Francisco Office outlined the evolving mission of his office in his speech. While JETRO San Francisco has traditionally supported Japanese exports, its current focus is on helping Japanese startups expand in the U.S. and global markets. This shift aligns with Japan's 2022 startup policy, which aims to foster 100 unicorns and 100,000 startups by 2027. He highlighted the importance of international collaboration, particularly through platforms like JURC, to drive global innovation and reaffirmed JETRO's commitment to supporting these initiatives.

After the remarks, each session organizer provided a brief introduction of the speakers and outlined the session's objectives.

In closing, **Prof. Chen** from National Yang Ming Chiao Tung University of Taiwan highlighted the extensive collaborations he has engaged in with Japanese universities to commercialize their research outcomes. He also noted the participation of a number of Taiwanese startup companies in this year's JURC and expressed his hope that the collaboration between Japan, the U.S., and Taiwan will continue to expand.

Opening Plenary Speakers

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

Genta Ando
Executive Director, Japan External Trade Organization (JETRO) San Francisco Office

Jeff Chen
Professor, National Yang Ming Chiao Tung University

Srabanti Chowdhury
Professor, Department of Electrical Engineering, Stanford University School of Engineering

Yotetsu Hayashi
Chief Executive Director, Japan External Trade Organization (JETRO) San Francisco Office

Makoto Ishii
Professor, Graduate School of Medicine, Nagoya University

Seiji Kumagai
Professor, Institute for the Future of Human Society, Kyoto University / Program Director, Moonshot R&D program Goal 9

Yuji Kuroiwa
Governor of Kanagawa Prefecture

Kyotaro Maeda
Director of North-America Center, National Institute of Information and Communications Technology (NICT)

Lloyd B. Minor
The Carl and Elizabeth Naumann Dean of the Stanford University School of Medicine

Nathaniel Moorman
Associate Professor, The University of North Carolina School of Medicine

Koichiro Nakamura
Senior Managing Director, Sozo Ventures

Toshihiko Nishimura
Co-Director of SLDDDRS, Stanford University School of Medicine

Ryuta Nomura
CEO and Chairman of the Board, Central Institute for Experimental Medicine and Life Science

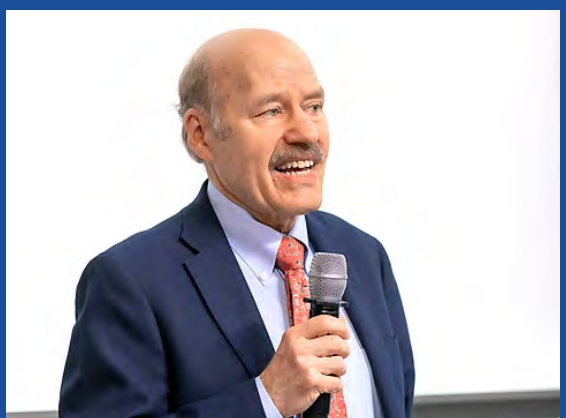
Yuichi Ono
Professor, International Research Institute of Disaster Science at Tohoku University

Yo Osumi
Consul General of Japan in San Francisco

Ramasamy Paulmurugan
Professor, Department of Radiology, Stanford University School of Medicine

Ronald Pearl
Dr. Richard K. and Erika N. Richards Professor and Co-Director of SLDDDRS, Stanford University School of Medicine

Takeshi Usami
Director, Washington D.C. Office, Japan Science and Technology Agency



July 29 Monday, 11:00 - 13:30

Gene Therapy from Platform to Today

Organized by Stanford University

Matthew Porteus, Professor, Department of Pediatrics, Stanford University School of Medicine who is the key opinion leader on Gene therapy and have utilized CRSIPR-Cas9 to modify HSPCs genetically, enabling them to increase red blood cell production as well as sickle cell disease and cystic fibrosis. He provided the introduction and 5 speakers presented their advanced gene therapies and did the panel discussion.

Masayuki Yamamoto, Executive Director. Professor, and Executive Director, Tohoku Medical Megabank Organization identified the KEAP1-NRF2 system that controls the cellular response to oxidative stress. He talked on **"Return of Genetic Risk to Participants of the Tohoku Medical Megabank."** While the RoGR to the general cohort participants needs exceptional care and harbors a number of unsolved issues, we believe that our attempts are important pilot studies toward the implementation of genetic risk assessment into the personalized healthcare and medicine. TMM believes that building the integrated biobank through large-scale genome cohort studies will be pivotal in advancing personalized health care and medicine.

Ramasamy Paulmurugan, Professor in Radiology at Stanford under the Molecular Imaging Program (MIPS) and Canary Center for Cancer Early Detection. He talked on **"Ultrasound Guided Delivery of Gene Directed Enzyme Prodrug Therapy (GDEPT) to Cancer- A Novel Clinically Relevant Approach for Cancer Gene Therapy."**

He showed a successful triple GDEPT system (TK-p53-NTR) for effective treatment of cancer using suicide gene therapy. The p53 co-expression from this construct facilitated for achieving enhanced treatment outcome in cancer cells independent of their endogenous p53 status. The US-MB mediated gene delivery system improved the localized delivery of therapeutic genes in the tumor with minimal non-specific delivery to normal cells.

Hideto Kojima, Professor, Shiga University of Medical Science. He talked on **"Gene therapy for neuropathic pain using cell-targeting peptides"** He showed that a mouse nerve cell-specific targeting 7-digit peptide was obtained by in vitro and/or in vivo subtraction biopanning using M13 phage display. A viral vector was created using cultured 293Cre cells, and a nanodiamond vector or oligopeptide vector by generating a supramolecule by electrostatic binding. A good cell targeting sequence was obtained. The virus, nanodiamond, and oligopeptide used as carriers all showed good fluorescent protein expression in specific target cells. Furthermore, he showed gene therapy using therapeutic vectors improved hyperalgesia caused by inflammation.

Hideyuki Saya, Director, Oncology Innovation Center, Fujita Health University. He talked on **"Novel Therapeutic Approach for Cancer Associated Fibroblasts and Fibrotic"**. He has identified that normal cells surrounding cancer can transform into cancer-associated fibroblasts (CAFs) through the activation of the MKL1 molecule, contributing to cancer progression and fibrotic disorders such as pulmonary fibrosis. We are developing therapies to inhibit MKL1 activation, including drug treatments and gene therapy using a new, low-toxicity herpes simplex virus vector.

Speakers

Hideto Kojima
Distinguished Professor, Shiga University of Medical Science

Ramasamy Paulmurugan
Professor, Department of Radiology, Stanford University School of Medicine

Matthew Porteus
Professor, Department of Pediatrics, Stanford University

Hideyuki Saya
Director, Oncology Innovation Center, Fujita Health University

Masayuki Yamamoto
Professor, Graduate School of Medicine , Tohoku University

July 29 Monday, 14:00 - 18:30

World Bosai Forum @ Silicon Valley 2024

Organized by World Bosai Forum Foundation and International Research Institute of Disaster Science, Tohoku University

Introduction

The meeting began with an introduction to the World Bosai Forum, an event aimed at sharing information and practical solutions for disaster risk reduction. The focus of the forum was to address the challenges posed by climate change and to explore ways to enhance resilience through collaboration between various stakeholders, including academia, start-ups, investors and policy makers.

Presentations

In this part of the session, various techniques and approaches for disaster risk reduction, resilience planning and recovery modelling across different regions and hazard types were discussed. Key topics included computational modelling to predict human mobility patterns during disasters, open source software tools to simulate the impact of natural hazards, community risk assessment frameworks, and community resilience measurement. Several speakers introduced research centers, projects and industry collaborations that focused on developing advanced simulation capabilities, data-driven decision support systems, and innovative business models for disaster resilience services.

Investor Perspectives and Business Model Considerations

Sozo Ventures investor, **Mr. Nakamura**, provided insight into the challenges of developing a sustainable business model for disaster-resilient solutions. He emphasized the importance of identifying the right customers, defining a clear value proposition, and seeking innovative revenue streams beyond traditional consulting and government contracting. Examples of successful business models from other industries were highlighted, including performance-based contracts and the development of unique data products.

Interdisciplinary Collaboration and Scaling Solutions

The discussion emphasized the need for interdisciplinary collaboration and partnerships between academia, industry, government and investors to address the complex challenge of building disaster-resilient cities. It was agreed that the expansion of solutions with global impact is an important goal, and that a combination of technological innovation, policy change and financial support is necessary. The role of government agencies in funding basic research and promoting public-private partnerships was also discussed.

Conclusions and Ways Forward

It was quite inspiring to hold this multi-stakeholder session on disaster risk reduction (DRR) at Stanford University in Silicon Valley, with its free atmosphere and active investment environment, with renowned scientists and practitioners from the US and Japan and more than 50 participants. The Fourth World Bosai Forum would continue to provide a venue for bringing together DRR researchers and investors.

Co-moderators

Yuichi Ono
Professor, International Research Institute of Disaster Science at Tohoku University

Daan Liang
Program Director, National Science Foundation/ Professor, University of Alabama

Keynote Speaker

Shunichi Koshimura
Professor, International Research Institute of Disaster Science, Tohoku University

World Bosai Forum Speakers

Jack Baker
Professor of Civil & Environmental Engineering, Stanford University

Matthew DeJong
Ray & Shirley Clough Presidential Chair in Structural Engineering, Assoc. Professor, UC- Berkeley / PI and Co-Director, NHERI SimCenter

Takanobu Kawano
CEO, Vacan Inc.

Koichiro Nakamura
Senior Managing Director, Sozo Ventures

Julio Ramirez
Karl H. Kettelhut Professor in Civil Engineering, Purdue University, NHERI-NCO Center Director

Shoichi Tateno
Public Private Partnership & Sustainability Team Leader, Weathernews Inc.

Ayano Todoroki
Engineer, DX Business Promotion Department, Pacific Consultants Co., LTD.

John W. van de Lindt
Professor, Harold H. Short Endowed Chair, Colorado State University

Takahiro Yabe
Assistant Professor, Center for Urban Science and Progress and Department of Technology Management and Innovation, New York University

Hiroki Yoshitake
General Manager, Tsukuba Research Center, Pacific Consultants Co., LTD.

July 29 Monday, 16:00 - 18:00

Promoting Global Health Advancements through Innovative Technology

Organized by Nagoya University and Stanford University

This session focused on integrating cutting-edge technologies to improve health profiling, disease prediction, and overall global health outcomes.

The first speaker, **Prof. Makoto Ishii** from Nagoya University, presented on **"Advancing Global Health: Strengthening Stanford-Nagoya Collaboration."** Prof. Ishii discusses a research initiative between Nagoya University and Stanford University, started in 2021, which integrates wearable technology data with multi-omics data to predict disease onset - particularly for infectious diseases – and enable early diagnoses. The study spans participants from both Japan and the United States.

Next **Prof. Rui Yamaguchi**, Chief at Aichi Cancer Center, introduced a groundbreaking approach in his talk **"Revealing Dynamic Systems Behaviors Behind Personalized Omics Profiling Data using a Physics-Informed Neural Network."** He discussed a machine learning method to infer the RNA-related dynamic activities such as transcription, splicing, and degradation rates. This method provides valuable insights beyond conventional RNA-seq time-series data analysis.

Prof. Karla Kirkegaard from Stanford University's Departments of Genetics and Microbiology & Immunology, followed with her lecture, **"New Paradigms for the Suppression of Viral Drug Resistance."** She addressed how viral mutations contribute to immune evasion and drug resistance, complicating infection control. As a potential solution, she introduced the AI-driven Structure-enabled Antiviral Platform (ASAP), aimed at developing antiviral drugs that minimize the risk of resistance.

The final speaker, **Prof. Michael Snyder** from Stanford's Department of Genetics, delivered a talk titled **"Disrupting Healthcare Using Big Data and Remote Monitoring."** He discussed the potential of big data and remote healthy monitoring to detect early signs of disease before symptoms emerge. His presentation highlighted the use of multi-omics technologies, wearable devices, and micro-sampling to proactively monitor health, showcasing recent advancements from his research.

Global Health Speakers & Co-moderators

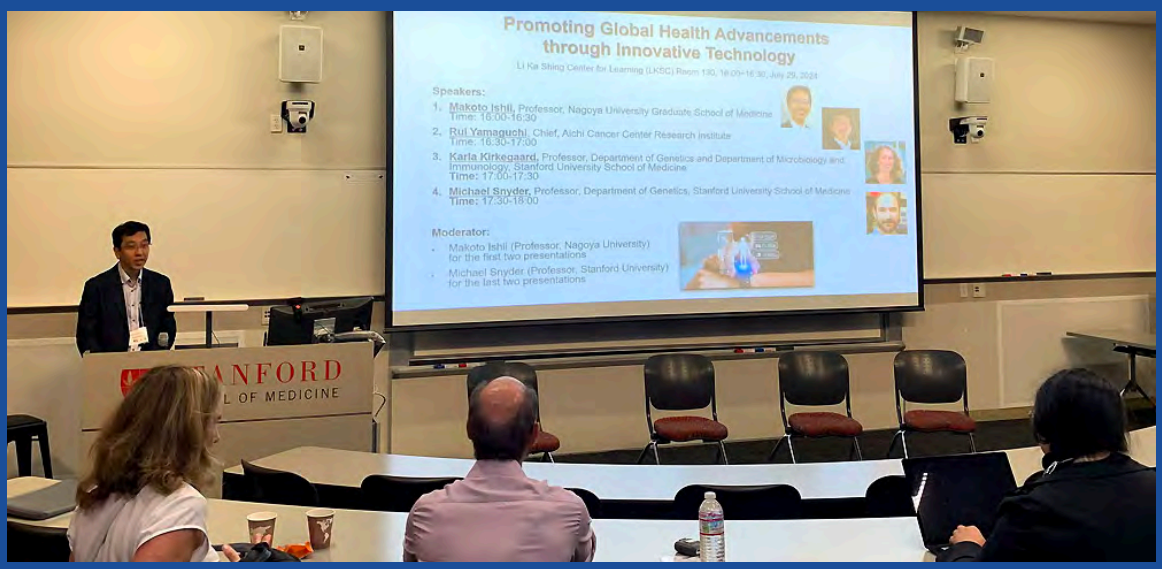
Makoto Ishii
Professor, Department of Respiratory Medicine, Nagoya University

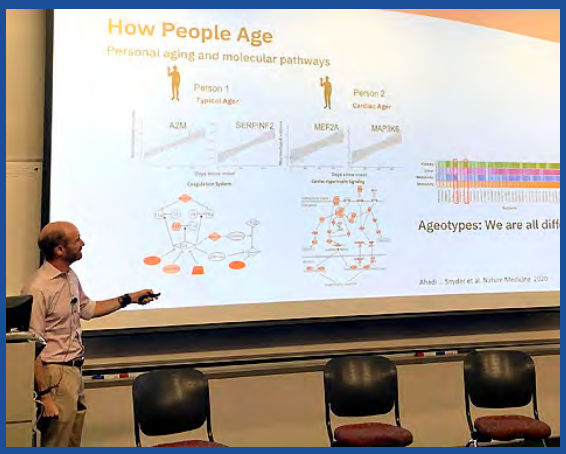
Michael Snyder
Professor, Department of Genetics, Stanford University School of Medicine

Global Health Speakers

Karla Kirkegaard
Professor, Department of Genetics and Department of Microbiology and Immunology, Stanford University School of Medicine

Rui Yamaguchi
Chief, Aichi Cancer Center Research Institute





July 30 Tuesday, 8:30 - 10:30

The Future of Space Communications

Organized by National Institute for Information and Communications Technology

Summary

The first speaker, **Kyotaro Maeda**, Director of North-America Center, National Institute of Information and Communications Technology began by expressing his desire to deepen discussions with various experts to realize this potential in this session that would be structured around discussions from three perspectives: (1) research and development, (2) industry, and (3) ecosystems, followed by a Q&A session.

Research and Development

Next, **Takeshi Matsumura**, Director of Wireless Systems Laboratory, National Institute of Information and Communications Technology spoke regarding space communications. He emphasized the need for seamless connectivity, pointing out the necessity of securing frequency resources and developing optical satellite communications. He also mentioned NICT's research on drone communication systems.

Regarding cybernetic avatars, he discussed their potential applications and stressed the need for reliable communication between avatars and operators under various network conditions.

Industry

Issei Suzuki, Head of Innovation & Business Development, JSAT International, Inc, mentioned the current focus on the Space Integrated Computing Network. He explained the establishment of Space Compass, a joint venture with NTT, to handle the transmission and reception of massive amounts of data, and introduced the network's components: space data centers, optical

data relays connecting ground-LEO-GEO, and space RAN, a mobile network using HAPS in the stratosphere.

Additionally, he discussed new initiatives, including building a Space Situational Awareness network that uses optical telescopes in geostationary orbit to monitor space and the world's first active debris removal satellite using laser technology (Orbital Lasers).

Ashley Johnson, President and Chief Financial Officer, Planet, then spoke on Remote Sensing. She explained that Planet's primary mission is to collect Earth data, analyze it leveraging a cloud platform and modern ML/AI tools, and provide it to promote digital transformation, sustainable change, and peace and security.

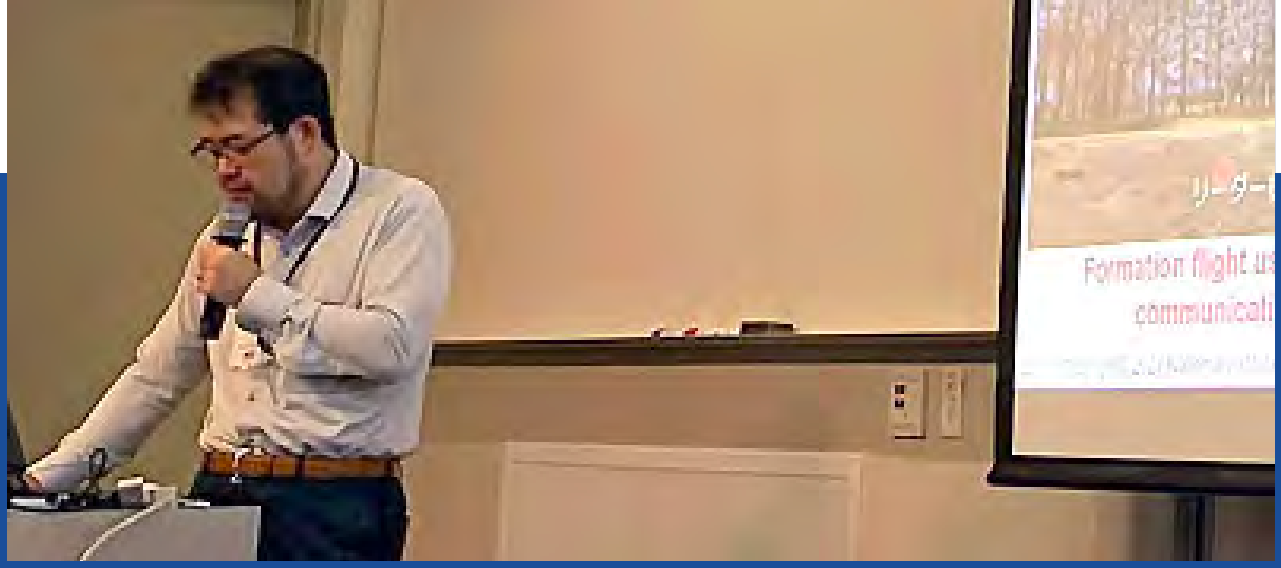
As an example, she highlighted how Planet, through partnerships with companies like Microsoft, has used enhanced AI-driven analytics to support governments with disaster response and quickly assessing the damage in places like Ukraine and Lahaina, Hawaii, to optimize resource allocation efficiently.

Ecosystem

Next, **Darek DeFreece**, Executive Director, Berkeley Space Center, University of California, Berkeley, spoke on the Berkeley Space Center Project. He began by showing a video explaining the project:

https://youtu.be/OQSkgPTyQS0?si=JzpcB48ETINklpX8

The Berkeley Space Center project aims to build necessary facilities at NASA Ames Research Center and establish an ecosystem focused on aerospace, advanced quantum computing, AI, and robotics, with the goal of starting operations in three years and fostering the creation of 200 companies annually.



Moderator

Kyotaro Maeda
Director of North-America Center, National Institute of Information and Communications Technology (NICT)

Speakers

Darek DeFreece
Executive Director, Berkeley Space Center, University of California-Berkeley

Ashley Johnson
President and Chief Financial Officer, Planet

Takeshi Matsumura
Director of Wireless Systems Laboratory, National Institute of Information and Communications Technology (NICT)

Issei Suzuki
Head of Innovation & Business Development, JSAT International, Inc.

July 30 Tuesday, 11:00 - 13:30

The Three Pillars of Pandemic Preparedness

Organized by The University of North Carolina at Chapel Hill

Developing a full arsenal of antiviral countermeasures today is critical to ensure the world is prepared before the start of the next global pandemic. Preparedness relies on three pillars: diagnostics, therapeutics, and vaccines. In this session, speakers from the U.S. and Japan discussed their strategic initiatives to counter the inevitable next threat.

Nathaniel Moorman, associate professor at UNC-Chapel Hill and co-founder of the Rapidly Emerging Antiviral Drug Development Initiative (READDI), chaired the session. He emphasized the importance of ongoing global collaboration to reduce the acuity, mortality, and economic impact of a future pandemic. “When the threat arrives,” he said, “it’s too late.”

Mark Heise, Professor at UNC-Chapel Hill and co-founder of READDI, discussed READDI’s mission to develop broad-spectrum small molecule antiviral drugs that can be effective against multiple viruses from the same family. READDI is one of nine Antiviral Drug Discovery (AViDD) Centers for Pathogens of Pandemic Concern, funded by the U.S. National Institutes of Health (NIH). To date, READDI has screened 120,000 molecules for their effectiveness, and multiple molecules are now in the pipeline.

Jeffrey Glenn, professor at Stanford University, leads SyneRX, the AViDD Center based at Stanford. SyneRX develops outpatient antiviral cocktails against SARS-CoV-2 and other potential pandemic RNA viruses. Funding from NIH supports three years of SyneRx’s research and development work, up to the beginning of clinical testing. Glenn says the goal “is for the top molecules we identify to be spun off to industry, which can take them all the way to approval and stockpiling so they’re available for use in future pandemics.” He said, “it’s natural to think internationally,” about pandemic preparedness because “together we can do so much more.”

Hideki Ueno, professor at Kyoto University, outlined the Japanese government’s pandemic preparedness strategy. In March 2022, the Japan Agency for Medical Research and Development (AMED) established the Strategic Center of Biomedical Advanced Vaccine Research and Development for Preparedness and Response (SCARDA). SCARDA has established vaccine centers at five Japanese universities. The research focus at Kyoto University, however, is human immunology, examining how individuals respond differently to viruses. Ueno and his team are assembling a database of human immunity, with a long-term vision for developing “immune scores” that could help clinicians personalize vaccinations.

Panelists discussed strategies for enabling global collaboration. Glenn said it works best “when both partners feel they’re getting something out of it.” Ueno said his immunology work depends on collecting numerous samples, including from global populations. Heise said that different global perspectives can lead to better, more applicable, and more accessible solutions.

Moderator

Nathaniel Moorman

Associate Professor, The University of North Carolina at Chapel Hill / Co-founder and Scientific Adviser, Rapidly Emerging Antiviral Drug Development Initiative (READDI)

Speakers

Jeffrey S. Glenn

Joseph D. Grant Professor and Professor of Microbiology and Immunology, Stanford University

Mark Heise

Professor, School of Medicine, University of North Carolina at Chapel Hill, Co-founder and Scientific Advisor, READDI

Hideki Ueno

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

July 30 Tuesday, 13:15 - 15:45

Transdisciplinary Challenges for Mental Resilience

Organized by Japan Science and Technology Agency and Stanford University

The social issues surrounding mental health have expanded and become increasingly extreme, necessitating our attention and focus. How can we effectively address this situation? The key lies in developing a comprehensive understanding of mental health and promoting empathetic interpersonal and intergroup communication that guides us in a mutually beneficial direction.

To achieve this, we pursue transdisciplinary collaboration to understand and address mental health in society, including developing technology that provides peace of mind and endurance. To promote research collaboration, we will showcase cutting-edge activities in novel research development.

After his opening remarks, **Prof. Ronald Pearl** introduced five speakers to the audience. Each speaker explained his/her study and research activities from unique science viewpoints in terms of mental health and resilience aspects. Following the speakers' presentations, Prof. Ronald Peal moderated roundtable a discussion for around 30 minutes during which the five speakers could exchange their own ideas/opinions regarding mental health and resilience aspects.

One of the topics during the roundtable discussion was how to promote societal well-being. Each speaker offered a unique approach using scientific ideas to cultivate the well-being of society, as well as peace of mind and vitality. A central topic discussed was the "visualization of the mental state" of individuals in society seen as a crucial element from a science viewpoint. Understanding human mental states is important for fostering the well-being of society, but equally important is the ability to manage these states. However, mental control presents both opportunities and challenges, requiring careful attention to ensure it contributes positively to overall well-being.

This is the second year to organize the session of "Transdisciplinary Challenges for Mental Resilience". We will continue to explore ideas for the focus of future Japan-US collaborations.

Moderator

Ronald Pearl
Dr. Richard K. and Erika N. Richards Professor and Co-Director of SLDDDRS, Stanford University School of Medicine

Speakers

Victor G. Carrión
Vice Chair, Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine

Tom Evans
Program Director, Human-Environment and Geographical Sciences, National Science Foundation (NSF)

Ann Hsin
Professor, Medicine and Epidemiology and Population Health, Stanford School of Medicine

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

Yasue Mitsukura
Professor, Department of System Design Engineering, Faculty of Science and Technology, Keio University

July 30 Tuesday, 13:30 - 15:30

Creating Core Research Community and Fostering Talent Mobility for promoting Japan-US S&T Collaboration

Organized by Japan Science and Technology Agency, Japan Society for the Promotion of Science, and United Japanese Researchers Around the World

This session aimed to seek insights into current efforts as well as future directions in building research community and promoting the mobility of researchers. A focus on young researchers, which are important for the sustainable development of research cooperation between Japan and the United States was emphasized.

In the first half, three funding agencies in Japan (JSPS, AMED, and JST) and one in the U.S. (NSF) introduced their respective efforts. JSPS, AMED and JST introduced various programs supporting international collaborative research and researcher mobility, as well as fellowships. NSF introduced their international programs, in addition to core programs in which international cooperation can be incorporated and the principal investigators can hire non-U.S. students and post-docs.

In the latter half of the session, researchers from universities gave presentations on their experiences in international activities as well as challenges they have faced in the past or are facing in the present, followed by a discussion on expectations of the funding agencies from the university perspective. In the first part of this session, young Japanese researchers studying in the U.S. shared their perspectives about the necessity of increasing stipends for recipients of Japanese fellowships which would ideally be equal to the salaries in the U.S. They also mentioned a need for increased access to flexible research funds for young post-docs in the U.S. In the second part, a U.S. educator with experience in international education related to Japan underscored the importance of exposing young people to international issues from high school. Participants highlighted the need for regional governments to step up for this purpose. In the third part, a university professor running a Japan-U.S. collaboration center shared another perspective. The importance of understanding the differences in the academic systems and financial circumstances between universities in Japan and the U.S. as well as cooperation between funding agencies and universities to overcome these differences was discussed. The importance of offering more students with opportunities for overseas experiences to promote the internationalization of Japanese universities was also discussed.

Based on these discussions, the exchange of information and ideas between researchers and funding agencies, which act as intermediaries between policy and research, was deemed crucial for advancing research cooperation between Japan and the U.S.

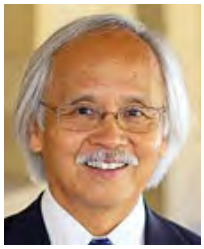
Moderator

Takeshi Usami
Director, Washington DC Office, Japan Science and Technology Agency

Speakers

Anne Emig
Section Chief for Multilateral Engagement, Program Director for Japan, Office of International Science & Engineering, National Science Foundation (NSF)

Dai Minowa
Deputy Manager, Department of International Affairs, Japan Science and Technology Agency



Gary Mukai
Director, Stanford Program on International and Cross-Cultural Education (SPICE), Stanford University

Yusuke Nakabeppu
Director, San Francisco Office, Japan Society for the Promotion of Science (JSPS)

So Ozawa
Assistant Professor, Earthquake Research Institute, University of Tokyo/ Visiting Scholar, Stanford University

Masafumi Sato
Director, Washington DC Office, Japan Agency for Medical Research and Development (AMED)

Koji Sode
William R. Kenan Jr. Distinguished Professor, Joint Department of Biomedical Engineering, UNC at Chapel Hill & North Carolina State University

Reika Tei
Life Sciences Research Foundation Postdoctoral Fellow, Department of Genetics, Stanford University School of Medicine

Junji Urakawa
Director, Washington Office, Japan Society for the Promotion of Science (JSPS)

July 30 Tuesday, 16:00 - 19:00

Energy and Materials for Sustainable Society

Organized by Nagoya University and Stanford University

Exponentially growing computational demand is causing huge power demands. Data center power demand growth is expected to be 8% in 2030 in the US and 40-50% between 2023 and 2033 in Europe. An adequate supply of high-efficiency semiconductor chips is a priority to satisfy future computational demand. **Debendra Das Sharma** proposed a new chiplet-based platform, using "Universal Chiplet Interconnect Express™ (UCIe™)" standard and its future extensions. The concept of UCIe™ is to manufacture chips with different roles and connect them with a standard high-speed interface. Currently, UCIe supports 2-dimensional and 2.5-dimensional interconnects to connect multiple chiplets in a system-in-package chips (SiP) interconnects, with technologies such as embedded multi-die interconnect bridges. Future 3-dimensional UCIe can support vertically connected chiplets in SiPs. By reducing bump pitch and increasing the bump density, the power required for each bit will be reduced while delivering higher bandwidth. This will improve performance significantly, as compute, memory and interconnect demands can be balanced, resulting in overall reduction of power.

Government leadership is essential to reduce global greenhouse gas emissions and limit the rise of global average temperatures. The Ministry of the Environment of Japan (MoEJ) promotes the gallium nitride (GaN) project to contribute to the realization of a decarbonized society in the world. **Gen'ichiro Tsukada** spoke on the importance of establishing manufacturing technologies for GaN wafers, GaN substrates, GaN on GaN devices, and their modules through the introduction of MoEJ's GaN project. Applications of GaN on GaN include blue laser processing machines, highly efficient information and communication technology (ICT) devices, and marine radars.

Some of the most important applications of SiC and GaN as wide-bandgap (WBG) semiconductors are inverters and DC-DC converters for electric vehicles. **Dinesh Ramanathan** gave a presentation detailing OnSemi's efforts in manufacturing WBG-based devices for EV applications.

Koichi Ota introduced the history of collaboration between Toyoda Gosei and Nagoya University on blue LEDs. It started as a joint industry-academia-government project on GaN-based blue LEDs in 1987 with the support of the Japan Science and Technology Agency, mass production began in 1995 and a patent litigation between two Japanese companies took place from 1996 to 2002.

To reduce the energy consumption for computation, **Helmut Puchner** explained two approaches; one is the use of GaN high-electron-mobility transistors (HEMT) on Si substrate and the other is analog-in-memory compute (AIM). He emphasized the high radiation hardness of a GaN HEMT on Si because it does not use oxide as a gate. As the multiply-accumulate operation (MAC) is embedded in the memory, AIM shows greater energy efficiency compared with von Neumann computing, in which large energy loss occurs during data transmission between the memory and the processor. The use of silicon oxide nitride oxide silicon (SONOS) flash memory will be effective in improving the precision of the bits compared with other memories. SONOS-based in-memory computation demonstrates near-digital accuracy while delivering unprecedented power efficiency.

Finally, **Srabanti Chowdhury** gave a closing comment.

Co-moderators

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

Srabanti Chowdhury
Professor, Department of Electrical Engineering, Stanford University School of Engineering

Speakers

Debendra Das Sharma
Intel Senior Fellow and co-GM of Memory and I/O Tech in Data Platform and AI Group, Intel Corporation

Koichi Ota
Senior Advisor (ex-Managing Director), Toyoda Gosei Co. Ltd. / Visiting Professor, Nagoya University

Helmut Puchner
Vice President Fellow Aerospace and Defense, Infineon Technologies

Dinesh Ramanathan
Vice President, Corporate Strategy, Onsemi

Gen'ichiro Tsukada
Director, Climate Change Projects Office, Global Environment Bureau, Ministry of the Environment of Japan

July 31 Wednesday, 9:00-12:00

Deep-tech Start-up Ecosystem: Breakout Sessions

Organized by Stanford University, JETRO, Sozo Ventures

There were three breakout sessions. Each breakout session consisted of three consecutive sub-sessions. The session started with the introduction and overview by the academic expert, then three start-up representatives presented outlines and highlights of their companies. The venture capitalist expert provided comments and advice. After that, the speakers held panel discussions. The panel discussions covered a wide range of topics, including the challenges faced by each start-up, the lessons learned, and what is needed for the development of the future start-up ecosystem.

Deep-tech Start-up Ecosystem: Breakout Session 1; Biotech, Healthtech (1), and Agetech (ME-BYO)

Speakers - Biotech

- **Peter N. Kao**, Stanford University
- **Jean Lu**, (Academia Sinica), Mercy Cell
- **Yasuto Yamaguchi**, u-Medico
- **Taichi Yamamoto**, (CIEM) Miucyte Technologies / In-Vivo Science
- **Chihiro Hosoya**, Rx+ Open Business Creation Lead, Astellas Pharma

Speakers - Healthtech (1)

- **Ronald Pearl**, Stanford University
- **Eliza Huang / Jeff Chen** (NYCU), PrecGenome
- **Hideyuki Saya**, (Fujita Health University), FerroptoCure
- **Kazuyuki Matsuda**, KORTUC
- **Chihiro Hosoya**, Rx+ Open Business Creation Lead, Astellas Pharma

Speakers - Agetech (ME-BYO)

- **Toshihiko Nishimura**, Stanford University
- **MJ Chey**, Integral Health
- **Takeo Nagura** (Keio University), iMU
- **Masayuki Hirata**, (Osaka University) JiMED


Mercy Cell Inc
Transcription Factor-Driven Functional Cell Production Platform: Pioneering the Future of Regenerative Medicine
Jean Lu and Sonia Sun


Stanford MEDICINE
10:40


INTEGRAL HEALTH

Deep-tech Start-up Ecosystem: Breakout Session 2; SaaS, Robotech, and Healthtech (2)

Speakers - SaaS

- **Masakatsu Fukai**, Nagoya University
- **Honghao Deng**, Butlr
- **Naoto Sakakibara**, eneye
- **Noriyuki Matsuda**, Pocketalk
- **Pavan Ongole**, MFV Partners

Speakers - Robotech

- **Michael Huang**, Development Center for Biotechnology
- **Karthee Madasamy** on behalf of Oregon University, Agility Robotics
- **Yoshi Shiomi**, Kailas Robotics
- **Grace Chen**, (Development Center for Biotechnology), Optavi Biotech
- **Karthee Madasamy**, MFV Partners

Speakers - Healthtech (2)

- **Yasuto Yamaguchi**, Kobe Universtiy / Santen Pharmaceutical
- **Eijiro Tsukada**, World Matcha
- **Hiroto Kawashima**, (Chiba University), AntiDrug System
- **Frank Lu**, (NTU Hospital), ChiXeNo Biotechnology
- **Pavan Ongole**, MFV Partners

Deep-tech Start-up Ecosystem: Breakout Session 3; Agetech, Healthtech, Disaster Preparedness, and AI

Speakers - Agetech, Healthtech

- **Yoshitaro Kumagai**, OURA Ring / Tohoku University
- **Morikazu Nakagawa**, FANCL
- **Fumihisa Kojima**, Biozipcode
- **Jason Zhu / Michael Snyder**, (Stanford University), SensOmics
- **Spencer Foust**, Sozo Ventures

Speakers - Disaster Preparedness

- **Ryuta Nomura**, CIEM (Central Institute for Experimental Medicine and Life Science)
- **Masayuki Yamamoto**, (Tohoku University), ToMMo
- **Yuichi Ono**, (Tohoku University), IRIDeS
- **Hideki Ueno**, (Kyoto University), KIC/SCARDA
- **Koichiro Nakamura**, Sozo Ventures

Speakers - AI

- **Rui Yamaguchi**, Aichi Cancer Center Research Institute
- **Sri Rao**, TieSet
- **Vijay Karamcheti**, Akridata
- **Costa Colbert**, Vue.ai
- **Koichiro Nakamura**, Sozo Ventures

July 30 Tuesday, 13:00 - 17:30

Deep-tech Start-up Ecosystem: Plenary Discussion

Organized by Stanford University and Sozo Ventures

This session started with a review of last year's session after an introduction of SOZO.

Last year, we had leading educational institutions, support organizations, early-stage investors, and top performing universities from the US and around the world that drive innovation commercialization. They shared best practices, and discussed education initiatives under consideration in collaboration with JST and Stanford, providing insights into the platform.

Then, the current state of startups in Japan, in particular the critical lack of international co-investment and the need for partnerships with investment, education, and support organizations with a global track record, was discussed. Successful examples from the Kauffman Fellows Program and Start-X were presented as examples of successful startups.

Starting this year, we had a session on actual examples of initiatives that are in progress.
In the first session, we discussed the launch of AN Venture, a fund dedicated to supporting and investing in deep tech originating from Japanese universities. We also heard how Arch Venture, a leading global VC fund for deep tech, and SOZO, a partner of AN, are collaborating to provide support and investment in AN initiatives.

In the second session, the CEO of Atomic Machine, a founder of a materials-based DEEP Tech startup, explained the challenges of launching a company in the highly complex field of materials-based DEEP TECH. He further explained how he refined the business model and product, managed investors' investment and managed to attract investment from investors.

The third session featured a panel discussion with three former students from diverse backgrounds who had taken Stanford University's Capital Formation class. The shared how they founded their companies and how education played an important role in their success.

The session concluded with an explanation of the lessons learned from these cases and how JST, Stanford University, SOZO, and others will continue to support innovation and collaboration between the U.S. and Japan in the future.

Speaker and Moderator

Phil Wickham
Executive Managing Director,
Sozo Ventures

Speakers

Samira Daswani
Founder & CEO, Manta Cares

Jeff Holden
Founder & CEO, Atomic
Machines

Ken Horne
Managing Partner, AN
Ventures

Luomei Lyu
Founder & CEO, Sleepipa

Koichiro Nakamura
Senior Managing Director,
Sozo Ventures

Ari Nowacek
Partner, ARCH Ventures

James Savoldelli
Founder & CEO, Pesto


JAPAN-US
RESEARCH
COLLABORATION WEEK
2024
JULY 29 (MON) - JULY 31 (WED)
STANFORD UNIVERSITY
JAPAN INNOVATION CAMPUS
HOSTED BY:
Stanford MEDICINE
School of Medicine
Japan Science and Technology Agency
SCAN QR CODE TO DOWNLOAD PROGRAM

Hosts

Stanford MEDICINE | School of Medicine

JST Japan Science and Technology Agency

Co-organizers and Supporters

Consulate General of JAPAN San Francisco

AMED

JETRO Japan External Trade Organization

JSPS

NAGOYA UNIVERSITY

NICT National Institute of Information and Communications Technology

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

UJA

World Bosai Forum Foundation