

Kyoto University - University of Zurich Strategic Partnership Joint Symposium 2023 - Data Science and Social Impact -



京都大学
KYOTO UNIVERSITY



University of
Zurich^{UZH}



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Objective of the Symposium

To advance its development as a university that generates world-class knowledge, Kyoto University collaborates with other leading universities around the world. In 2013, the university concluded an agreement for academic cooperation and exchange with the University of Zurich, followed by a student exchange agreement in 2014. The conclusion of those agreements led to a deepening of exchange and collaboration between the two institutions, particularly in the fields of medicine, life science, and plant science. Based on the achievements made, a strategic partnership agreement was concluded by the two universities in July 2020. The strategic partnership, which is conducted under the leadership of the university presidents, seeks to promote the cross-disciplinary development of existing research and joint research in new fields, cultivate early-career researchers, and build a long-term collaborative relationship between the two universities through educational exchange.

Through its partnership with the University of Zurich, Kyoto University is promoting joint research and the exchange of early-career researchers. Joint research is being actively undertaken in the fields of medicine, plant science, and law, and collaboration on new research themes is also being initiated.

The Kyoto University-University of Zurich Strategic Partnership Joint Symposium 2023 will enable collaborating researchers to share their experiences and review the achievements of the strategic partnership to date. Also, under the theme of “Data Science and Social Impact,” the symposium will present joint research in the social and natural sciences on the ways that data science and AI can impact research and society as a whole, as well as aspects that should be considered for the future. It will also serve as a platform for the discussion of those topics.

Each session will endeavor to take a cross-disciplinary approach based on data science, in alignment with the aims of the strategic partnership.



**Welcome Messages
and
Profiles of Executive Staff**



Nagahiro Minato

President of Kyoto University

It is my great pleasure to welcome you to Kyoto University for the Kyoto University-University of Zurich Strategic Partnership Joint Symposium 2023.

Our first joint symposium was held at the University of Zurich in November 2013 and an academic exchange agreement between Kyoto University and the University of Zurich was also concluded at that time. The symposium marked a great step forward in the collaboration between our two institutions, and between our researchers. Since then, we have held a further joint symposium in 2016 and a joint workshop in 2019, and I am delighted that the global COVID-19 pandemic that has hampered international exchange in recent years has now abated sufficiently to allow us to hold this current joint symposium.

Upon my appointment as president in 2020, I set “the internationalization of research activities and dissemination of research results” as one of my core presidential priorities, and I consider our strategic partnerships with other leading universities around the world to be a key component of those efforts. We are very selective in choosing our strategic partners, and have concluded only five strategic partnership agreements since the initiative was launched four years ago. Our partnership with the University of Zurich was formalized in 2020, and we are deeply satisfied with the resulting development and expansion of our collaboration on research and other exchange activities.

I hope that the opportunities for knowledge-sharing and collaboration provided by this symposium will boost our collaborative research efforts, and ultimately contribute to the advancement of our greater overarching goals of addressing large-scale global issues and achieving sustainable development. In years to come, I hope that the symposium will be remembered as a major step forward in the history of collaboration between Kyoto University and the University of Zurich.



Michael Schaepman

President of University of Zurich

The “Kyoto University – University of Zurich Joint Symposium” is a wonderful platform to make the excellent research visible that is conducted between our two universities. This symposium is proof that our strategic partnership continues to get stronger and stronger, and I would like to express my appreciation to everyone involved for making this happen.

I particularly like the fact that the symposium involves so many early career researchers: It offers them an opportunity to establish connections, talk about their findings and gain a unique experience for their future career in academia. I am certain that this event will contribute to an even deeper alliance between our universities and that it will foster an innovative environment and lots of new ideas.

I regret that I will not be able to attend the event in person and am thankful to Vice President Christian Schwarzenegger for representing the Executive Board of the University of Zurich at this symposium. I wish everyone involved a productive and successful event, and I look forward to hearing all about the results and progress made during these two days.



Christian Schwarzenegger

Vice President Faculty Affairs and Scientific Information

University of Zurich

On September 16, 2022, Professor Shinya Yamanaka, Kyoto University, held a lecture about future developments of induced pluripotent stem cell research (iPSC) at the University of Zurich. Before the lecture and not less importantly he participated in a scientific exchange with young researchers to discuss iPSC and translational cell-therapy approaches. The research collaboration between Center for iPS Cell Research and Application (Kyoto University) and Institute for Regenerative Medicine (University of Zurich) started in 2017 and is stronger than ever before. Meanwhile, from July to December 2022, five professors from University of Zurich spent a sabbatical at Kyoto University, ranging from law, psychology to linguistics and sinology. As a result of these exchanges, a new joint research group in AI Regulation and Intellectual Property has been formed. The members will contribute to this very symposium.

These are only two examples of what a true partnership of leading universities can achieve. These cooperations foster new ideas, contribute to academic excellence and cutting-edge research on both ends. They encourage translation of research resulting in clinical application or leading to policy recommendations.

Over the past years, we have had the privilege of working together on a wide range of projects and initiatives in the fields of Medicine, Biology, Chemistry and Law, just to mention a few. I am particularly happy about the fact that this time young researchers from Kyoto University and University of Zurich join the symposium to share their knowledge and expertise. As we look in the future, I am excited to see the ways in which our strategic partnership will continue to evolve and grow. I am confident that we will continue to push the boundaries of what is possible and make a meaningful impact on the world.

I would like to take this opportunity to express my appreciation for the hard work and dedication of everyone involved in making this partnership a success.



Kyoko Inagaki

Executive Vice-President for Gender Equality,
International Affairs and External Affairs
Kyoto University

Education record:

1987	B.A. in Education, Faculty of Education, Kyoto University
1981	M.A. in Sociology of Education, Graduate School of Education, Kyoto University
1981-1983	Doctoral program in Sociology of Education, Graduate School of Education, Kyoto University
2009	Ph.D. in Sociology of Education, Graduate School of Education, Kyoto University

Job record:

Apr. 1983–Mar. 1985	Lecturer, Teikyo University Junior College
Apr. 1985–Mar. 1988	Lecturer, Faculty of Education, Shiga University
Apr. 1988–Sept. 1996	Associate Professor, Faculty of Education, Shiga University
Oct. 1996–Mar. 1998	Associate Professor, Faculty of Education, Kyoto University
Apr. 1998–Mar. 2005	Associate Professor, Graduate School of Education, Kyoto University
Apr. 2005–Mar. 2021	Professor, Graduate School of Education, Kyoto University
Apr. 2014–Mar. 2017	Vice-Dean, Graduate School of Education, Kyoto University
Apr. 2015–Mar. 2020	Member of the Education and Research Council, Kyoto University
Apr. 2016–Mar. 2020	Director, Faculty Consort for Education, Kyoto University
Apr. 2017–Mar. 2020	Dean, Graduate School of Education, Kyoto University
Oct. 2020 –	Executive Vice-President for Gender Equality, International Affairs, and External Affairs (University Fund Administration and Alumni Affairs), Kyoto University



Yasuyuki Kono

Vice-President for International Strategy

Kyoto University

Education record:

Mar. 1981	Bachelor degree, Faculty of Agriculture, The University of Tokyo
Mar. 1983	Master degree, Graduate School of Agriculture, The University of Tokyo
Mar. 1986	Doctor degree, Graduate School of Agriculture, The University of Tokyo

Job record:

Apr. 1986-Jul. 1987	JSPS Postdoctoral Fellow Graduate School of Agriculture, The University of Tokyo
Jul. 1987-Aug. 1992	Assistant Professor Center for Southeast Asian Studies, Kyoto University
Aug. 1992-Aug. 1994	Assistant Professor Irrigation Management and Engineering Program Asian Institute of Technology
Aug. 1994- Jul. 1998	Assistant Professor Center for Southeast Asian Studies, Kyoto University
Aug. 1998-Dec. 2005	Associate Professor Center for Southeast Asian Studies, Kyoto University
Dec. 2005-Now	Professor Center for Southeast Asian Studies, Kyoto University
Apr. 2010-Mar. 2014	Vice Director Center for Southeast Asian Studies, Kyoto University
Apr. 2014-Mar. 2018	Director Center for Southeast Asian Studies, Kyoto University
Apr. 2018-Now	Vice President for international strategy, Kyoto University
May. 2018-Oct. 2020	Director, Kyoto University European Center
Nov. 2020-Mar. 2022	Director, Kyoto University North American Center




Overall Program

1st Day (2023/3/7)

Time	Activity	Venue
9:00-9:30	Arrivals and Registration	Shiran Kaikan
9:30-10:05	Opening Ceremony	Shiran Kaikan (Inamori Hall)
9:30-9:35	Opening Address by Representative of Kyoto University - Nagahiro Minato (President)	
9:35-9:45	Opening Address by Representative of the University of Zurich -Michael Schaepman (President) (video message) -Christian Schwarzenegger (Vice-President)	
9:45-9:50	Address by Representative of Swiss Embassy -Andreas Baum (Ambassador of Switzerland to Japan)	
9:50-9:55	Exchange of Gifts	
9:55-10:05	Group Photo	
10:05-10:15	Break	
10:15-11:45	Opening Presentation: The Trajectory and Future of the Strategic Partnership	Shiran Kaikan (Inamori Hall)
10:15-10:30	Presentation: Looking Back on the KU-UZH Strategic Partnership -Yasuyuki Kono (Vice-President, Kyoto University)	
10:30-10:50	Presentation: The Strategic Partnership's Contribution to Fostering Early Career Researchers -Hirohide Saito (Kyoto University) -Melanie Generali (University of Zurich)	
10:50-11:45	Opening Dialogue -Yasuyuki Kono (Kyoto University) -Hirohide Saito (Kyoto University) -Melanie Generali (University of Zurich) -Moe Hirosawa (Kyoto University)	
11:45-13:15	Lunch Break	Shiran Kaikan Annex: Catering
13:15-15:15	Data Science and Social Science	Shiran Kaikan (Inamori Hall)
13:15-15:15	Presentations and Panel Discussion -Hiroki Habuka (Kyoto University) -Peter Picht (University of Zurich) -Florent Thouvenin (University of Zurich) -Yasuyuki Echi (Kyoto University) -Stephanie Volz (University of Zurich) -Tatsuhiko Inatani (Kyoto University) -Misaki Sumida (Kyoto University)	

2nd Day (2023/3/8)

Time	Activity	Venue
9:00-9:30	Arrivals and Registration	Shiran Kaikan
9:30-12:30	Early Career Researchers' Forum	Shiran Kaikan (Yamauchi Hall)
9:30-9:45	Address by the Consulate General of Switzerland in Osaka/Swissnex -Felix Moesner (Consul/CEO)	
9:45-10:00	Presentation on Funding Opportunities for ECRs	
10:00-12:30	Presentation and Discussion *For participants, please refer to page 22.	
12:30-14:00	Lunch Break	Shiran Kaikan Annex: Catering
14:00-16:30	Data Science and Natural Science	Shiran Kaikan (Inamori Hall)
14:00-16:30	Presentations and Panel Discussion -Kentaro Shimizu (University of Zurich) -Shuhei Nasuda (Kyoto University) -Michael Krauthammer (University of Zurich) -Koji Fujimoto (Kyoto University) -Kerstin Noëlle Vokinger (University of Zurich)	
16:30-16:45	Coffee Break	Shiran Kaikan (Yamauchi Hall)
16:45-17:10	Closing Ceremony	Shiran Kaikan (Inamori Hall)
16:45-17:00	Plenary Wrap-Up Session -Christian Schwarzenegger (Vice-President, University of Zurich)	
17:00-17:10	Closing Remarks by Representative of Kyoto University -Kyoko Inagaki (Executive Vice-President)	
17:10	End of Symposium	



Opening Presentation: The Trajectory and Future of the Strategic Partnership



Hirohide Saito

Professor

Center for iPS Cell Research and Application (CiRA)

Kyoto University

New cell purification method for next-generation cell therapy

Induced pluripotent stem cells (iPSCs) are promising cell resources for future clinical applications. However, differentiated cells derived from iPSCs are heterogeneous. Thus, a robust cell purification method is needed. MicroRNAs (miRNAs) can be used as a marker for target cells, as their activity differs between cell types. We have developed miRNA-responsive mRNAs that regulate protein expression levels in target cell. Using these mRNAs, we have collaborated with the Institute for Regenerative Medicine (IREM), the University of Zurich to purify clinical-grade cardiomyocytes derived from iPSCs. I would like to discuss about the importance of international collaborations and future challenges in the field.

Keywords:

Regenerative medicine, Cell therapy, mRNA, iPS cells

CV:

- Born in Osaka, Japan, 1973
- Doctor of Engineering (PhD), Department of Chemistry and Biotechnology, Graduate School of Engineering, The University of Tokyo, Japan, 2002
- Website: https://www.cira.kyoto-u.ac.jp/e/research/hsaito_summary.html

Hirohide Saito is a Professor at the Center for iPS Cell Research and Application (CiRA), Kyoto University. After completing predoctoral training at the University of Tokyo and SUNY Buffalo, he received his PhD from the University of Tokyo in 2002. He joined CiRA in 2011. He is interested in the fields of synthetic biology & cell programming. Using newly developed RNA technologies, he aims to understand the design principles of living systems and contribute to future medicine.



Melanie Generali

Head of iPSC Core Facility (iPSCore)

Medical Faculty / Institute for Regenerative Medicine

University of Zurich

Next-generation cell-based therapy for myocardial infarction

Over the past decade, the field of cell therapy has rapidly expanded with the aim to replace and repair damaged cells and/or tissue. Here we focus on the treatment of myocardial infarction, where currently available treatment options are not able to regenerate lost healthy heart tissue. Good manufacturing practice (GMP)-compatible cardiomyocytes (CM) were generated from transgene- and xeno-free induced pluripotent stem cells (iPSCs). To ensure a pure CM population for in vivo applications, we reduced the risks of iPSC contamination. In collaboration with Center for iPS Cell Research and Application (CiRA, Kyoto, Japan), RNA-switch technology was used to ensure a pure CM population for safe clinical applications. For our next step, we aim to specifically target these cells towards the ischemic environment of myocardial infarction for next-generation cell-based therapies.

Keywords:

induced pluripotent stem cells (iPSC), clinical translation, myocardial infarction

CV: Dr. Melanie Generali first studied biology in Germany and later in Switzerland. During her PhD at the IREM, she manufactured iPSC-based tissue-engineered vascular grafts. Later, she worked as a postdoctoral fellow on a project in close collaboration with the CiRA to regenerate ischemic heart tissue. In July 2021, she launched the iPSC Core Facility (iPSCore) at the UZH where she is now the program head. Furthermore, she is the representative of Switzerland in the European Network for Stem Cell Core Facilities (CorEuStem). Since end of 2022, she has been working as the head of cardiovascular tissue engineering and leading the new collaboration with the Nationwide Children's Hospital, Columbus, US.



Moe Hirosawa

Researcher

Center for iPS Cell Research and Application (CiRA)

Kyoto University

Purifying differentiated cells derived from induced pluripotent stem cells (iPSCs) is important for future clinical applications. MicroRNAs (miRNAs) are a candidate for detecting target cells because miRNA activity differs between cell types. Our laboratory developed miRNA-responsive ON and OFF mRNA switches in which protein expression levels are regulated by target miRNA. We and the Hoerstrup group at the Institute for Regenerative Medicine (IREM), University of Zurich, which has the technology to differentiate cells, try to purify the iPSC-derived endothelial cells and cardiomyocytes from heterogenous cell populations with these mRNA switches.

Keywords:

Cell purification, Synthetic biology, microRNA, mRNA switch, iPS cells

CV:

- Place of Birth: Japan
- Date of Birth: December 18th
- Research interests: Genome editing, Stem cells, Aging, Synthetic biology
- Education: Medical Science (PhD), Graduate School of Medicine, Kyoto University, Kyoto, Japan, 2019
- Employment History: 04/2019 - Present, Researcher, CiRA, Kyoto University, Kyoto, Japan
- Work Email: moe.hirosawa@cira.kyoto-u.ac.jp
- Office Address: 53 Kawahara-cho, Shogoin, Sakyo-ku, Kyoto, 606-8507, Japan



Data Science and Social Science



Hiroki Habuka

Research Professor

Graduate School of Law, Center for Interdisciplinary Studies of Law and Policy (CISLP)

Kyoto University

Designing Collaborative and Agile Governance for Society 5.0

On one hand, innovation in cyber-physical systems (CPSs) has brought tremendous benefits to our daily lives. On the other hand, it has led to uncontrollable risks to privacy, security, and other fundamental values. To tackle these risks and maximize the positive impact of such new technologies, we need a dynamic reform of society-wide governance. Considering this, the Japanese government issued three policy papers regarding “agile governance,” which is a distributed and coordinated governance model rather than the traditional command-and-control model. Prof. Hiroki Habuka, the lead author of those reports, will present why we need innovation in governance and how to implement it in society.

Keywords:

Governance, Multi-stakeholder, Agile, Cyber-Physical Systems, System of Systems, Data, AI

CV:

Hiroki Habuka specializes in agile governance, which is a multi-stakeholder, agile, and multi-layered framework for governing a fast-changing and complex society. He is the lead author of white papers discussing agile governance published by Ministry of Economy, Trade and Industry, Japan (METI), namely, “GOVERNANCE INNOVATION Ver.1” (2020), “GOVERNANCE INNOVATION Ver.2” (2021), and “Agile Governance Update” (2022). In 2020, he was selected by the World Economic Forum Global Future Councils on Agile Governance and Apolitical as one of the World’s 50 Most Influential People Revolutionizing Government (Agile 50).



Peter Georg Picht

Professor
Faculty of Law / Chair for Business,
Competition and Intellectual Property Law
University of Zurich



Florent Thouvenin

Professor
Faculty of Law / Chair for Information and
Communications Law
University of Zurich

Artificial Intelligence (AI) and Intellectual Property (IP): A European Perspective

The presentation will give an overview of the current state of AI-generated art and Intellectual Property Law in Europe. In doing so, it addresses key AI/IP issues, including business models of AI innovation leaders, inventorship/creatorship of AI systems de lege lata and de lege ferenda as well as the DABUS litigation about patentability of AI-generated inventions. In a joint research project, the Zurich AI/IP Group focused on questions of whether new types of IP rights are necessary to protect AI inventions, AI's potential raising the bar-effect, the allocation of entitlements and liability regarding such innovations, and the need for new protection carve-outs.

Keywords:

- Artificial Intelligence (AI) – de lege lata and de lege ferenda
- Intellectual Property Law (Patent Law and Copyright Law)
- DABUS
- Policy Recommendations



Yasuyuki Echi

Professor

Graduate School of Law

Kyoto University

AI-generated Content and Copyright

In recent years, image-generating artificial intelligence (AI) such as “Stable Diffusion” and “Midjourney” have been developing rapidly. We are entering an era in which anyone can easily generate content by using AI. My presentation will address the topic of whether AI-generated content can or should be protected by copyright law.

Traditionally, only creations by human beings are thought to be eligible for copyright protection. Hence, in many countries, AI-generated content is not protected by copyright law. My presentation will discuss the need for copyright protection of AI-generated content.

Keywords:

AI, Copyright

CV:

Professor, Graduate School of Law, Kyoto University, 2016-present

Associate Professor, Graduate School of Law, Kyoto University, 2004-2016

Research Assistant, Graduate School of Law, Kyoto University, 2001-2004



Tatsuhiko Inatani

Professor

Graduate School of Law

Kyoto University

Governance Innovation & Beyond: Law in Society 5.0

Society 5.0 is the ideal figure for Japan's future society, where physical and cyber systems are seamlessly integrated to solve social issues and stimulate innovation that enables sustainable economic growth. However, the emergence of a complicated, dynamic, and colossal system would raise serious issues requiring novel governance. Otherwise, we cannot fully benefit from Society 5.0. In this lecture, I explain a novel governance system for, by, and of innovation ("Governance Innovation") and the issues to be explored more under the novel governance system.

Keywords:

Governance System for Digitalized Society, Automated Governance

CV:

Tatsuhiko Inatani is a Professor of Law at Kyoto University. His scholarship focuses on law and technology matters and globalized corporate crime. He has published several influential books and articles about privacy protection in a digital era, the risk governance system of intelligent systems, and the legal philosophy of AI and robots. He is a member of several government committees, including study groups on a new governance model in "Society 5.0" (Ministry of Economy, Trade, and Industry) and future vision of autonomous robots (Information-Technology Promotion Agency-Digital Architecture Design Center) and a working group for provisional commission of administrative digitalization reform (Digital Agency).



Misaki Sumida

Attorney

Nagashima Ohno & Tsunematsu

(Kyoto University)

A New Corporate Regulatory Approach in Japan's Digital Arena

Japan's Act on Improving Transparency and Fairness of Digital Platforms (TFDPA) regulates giant digital platform providers such as Amazon, Apple, Google, and Meta. Its approach is novel, and it seeks to encourage providers to voluntarily improve the transparency and fairness of their transactions with their business users through continuous dialogue with stakeholders and evaluations by the government.

To ensure the act's effectiveness, it is important to give provide companies incentives to commit. Thus, the government has begun to publicize the status and evaluation of cases violating the act.

At the time the law was enacted, many questioned its effectiveness, but in the first year of its operation, certain effects have already been seen. This could be a pilot case for corporate regulation, known as co-regulation.

Keywords:

Digital platform, Co-regulation, Corporate crime, Incentive structure

CV:

- 2015 Kyoto University (LL.B.)
- 2017 Kyoto University Law School (JD)
- 2018 Nagashima Ohno & Tsunematsu
- 2021 Legal Specialist in Digital Economy Division / Digital Market Policy Office, Ministry of Economy, Trade and Industry (METI)
- 2023 Nagashima Ohno & Tsunematsu



Early Career Researchers' Forum

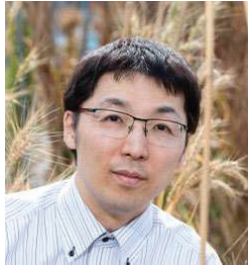
Participants List

Name	University	Presentation Title
Ahmed Allam	University of Zurich	Machine learning in genome editing research
Clara Duré	University of Zurich	Translational control in aged epidermal stem cells
David Taborsky	University of Zurich	Translational regulation in early development
Jil Affentranger	University of Zurich	Software under European Copyright Law: Protection and Accessibility in an AI context
Kana Eguchi	Kyoto University	Wearable Sensing System for IoT-Infused Healthcare
Martina Nubie	University of Zurich	Microglia-directed gene therapy
Mizuho Nishio	Kyoto University	Radiology report generation from chest X-ray image using 2-stage deep learning models
Moe Hirokawa	Kyoto University	Designing a new Genome Editing Tool
Moeko Okada	University of Zurich	Adaptation of wheat to the Asian environment and changes in food culture
Morteza Rohanian	University of Zurich	Supporting Clinical Oncology with Natural Language Processing
Naoto-Benjamin Hamaya	University of Zurich	Understanding the evolutionary genetics behind pollen number and disease resistance in wheat
Nie Jilu	Kyoto University	Exploring the wheat recombination landscape through physical and genetic mapping
Ruth Röck	University of Zurich	Creating kidney cells by direct reprogramming
Shunsuke Yoshioka	Kyoto University	A high-throughput phenotyping of wheat and modeling using the growth data
Valerie Leandra Brunner	University of Zurich	Computer-implemented Inventions under European Patent Law: Protection for computer simulations?
Yuma Tomizawa	Kyoto University	Pelvic morphology in primates

*Alphabetical Order



Data Science and Natural Science



Kentaro Shimizu

Professor, Co-Director of the University Research Priority Program of Evolution in Action

Vice-Director of the Department of Evolutionary Biology and Environmental Studies, Faculty of Science

University of Zurich

Toward the second "green revolution" by connecting Switzerland and Japan: genome data and machine learning of polyploid wheat

The green revolution in the mid-20th century exploited the semi-dwarfism of a Japanese wheat cultivar and increased world food production (Norman Borlaug, Nobel Peace Prize 1970). Recent climate change and the war in Ukraine have highlighted the critical importance of wheat production in broad geographic regions to guarantee food security. Genome analysis of bread wheat has been difficult due to the large genome size (>5 times larger than a human being) and its hybrid polyploid origin. In collaboration with the Wheat 10+ Genomes Project, we reported a genome assembly of the representative Japanese cultivar Norin 61 using recent advances in data science. Furthermore, we developed "PlantServation" to analyze images in naturally fluctuating environments using deep learning. The integration of large genomic and trait data will pave the way for the "second green revolution" by exploiting unique East Asian variants to cope with rapid climate changes.

The Japanese grant "International Leading Research" (2022-2030) was awarded to plant reproduction (Univ. Zurich, Univ. Tokyo, Kyoto Univ., and others). It will enhance our study through the exchange of young researchers.

Keywords: genome data, machine learning, image analysis, genome duplication

CV:

1997 BS (Biology), Kyoto University, Kyoto, Japan

2002 PhD (Biology), Kyoto University, Kyoto, Japan

2003 Research scholar at the North Carolina State University

2006 Assistant (2006), Associate (2011), and Full Professor (2019-), University of Zurich

2015 Visiting Professor at the Center for Ecological Research, Kyoto U. (Sabbatical)

2016 Director of the PhD Program in Evolutionary Biology



Shuhe Nasuda

Professor

Graduate school of Agriculture / Division of Agronomy
and Horticultural Science

Kyoto University

Towards data-driven breeding - combining genomics and high throughput phenotyping

The pan-genomes of wheat allow genome-wide surveys of genetic diversity, which gave way to associating allelic variations with phenotypes. Diverse methods are now available to evaluate the genetic variation in the genetic resources, and in wheat it leads to direct application of these resources to breeding programs. Of them, high-throughput phenotyping methods are key technology to address the challenges of accurate, precise, and large-scale measurements of plant performance. Soon, we will be able to design wheat by accumulation of favorable alleles, which will result in the breeding of wheat cultivars that are environmentally robust, with lower risk to human health.

Keywords:

genomics-assisted breeding, healthy food, polyploid, wheat

CV:

Education

- PhD in Genetics, Kansas State University, Kansas, USA (1999)
- MS in Agricultural Biology, Kyoto University, Kyoto, Japan (1992)
- BS in Agricultural Biology, Kyoto University, Kyoto, Japan (1990)

Employment history

- Kyoto University, Laboratory of Plant Breeding, Graduate School of Agriculture, Professor (2020–present)
- Kyoto University, Laboratory of Plant Genetics, Graduate School of Agriculture, Associate Professor (2014–2020)
- Kyoto University, Laboratory of Plant Genetics, Graduate School of Agriculture, Assistant Professor (1996–2014)
- Head of National BioResource Project-Wheat, MEXT, Japan (2012–2020)



Michael Krauthammer

Professor

Department of Quantitative Biomedicine

University of Zurich

AI in clinical medicine

The talk will review our recent work on using AI in medical research, including AI-assisted diagnosis and decision making, as well as AI-guided design of base and prime editors in the context of finding cures for human genetic diseases.

Keywords:

AI, diagnosis, medical decision making, genome editors, genetic diseases

CV:

My career spans across both medicine and informatics: After receiving an MD degree at the University of Zurich, Switzerland, I obtained a PhD in biomedical informatics at Columbia University in New York. I then joined Yale University School of Medicine where I led a research team working on Big Data projects in genetics. Back in Zurich (since 2018), I established a group in medical informatics with a particular focus on clinical data science and translational bioinformatics.

During my informatics career, I worked on various data science projects, including the GeneWays molecular interaction mining system and the Yale Image Finder platform for figure-centric literature navigation. My bioinformatics work led to the identification of important driver mutations in skin cancer (melanoma), a key development in the establishment of melanoma precision medicine.

Current data science projects involve the use of machine and deep learning for the prediction of hospital readmission, drug side effects and base editing outcomes (for base-specific editing of nucleotide sequences using CRISPR and similar tools). A further emphasis is on the use of AI for Natural Language Processing in the health domain. Our bioinformatics focus is on single cell analysis in skin cancer and the development of high-sensitivity tests for early disease detection and disease monitoring.



Koji Fujimoto

Program-Specific Associate Professor

Real World Data Research and Development
Graduate School of Medicine

Kyoto University

Data Science in Diagnostic Radiology

Diagnostic Radiology is a medical discipline concerning the interpretation of images obtained by medical devices (e.g., CT, MRI) such that appropriate decisions can be made for patients. We radiologists “read” medical images, extract information, and describe possible interpretations of identified abnormalities. Recent progress in artificial intelligence (AI) has opened various opportunities to make use of AI images and text in diagnostic radiology. This presentation introduces several approaches to organizing datasets and appropriately extracting information using recent AI technologies.

Keywords:

diagnostic radiology, deep learning, data science

CV:

Apr 2020 – present Associate Professor, Real World Data Research and Development, Graduate School of Medicine, Kyoto University

Feb 2017 – Mar 2020 Assistant Professor, Human Brain Research Center, Graduate School of Medicine, Kyoto University

Apr 2015 – Jan 2017 Visiting researcher, New York University Langone Medical Center

Apr 2010 – Mar 2015 Assistant Professor, Graduate School of Medicine, Kyoto University

Nov. 2010 PhD (Medicine)

Apr 2006 – Mar 2010 Graduate School of Medicine, Kyoto University



Kerstin Noëlle Vokinger

Professor

Faculty of Law and Faculty of Medicine

University of Zurich

Regulation of Artificial Intelligence in Medicine

Artificial intelligence (AI) technologies are being increasingly introduced in clinical practice, and the number of cleared medical AI devices has increased over the past years. These new technologies offer opportunities for improving patient care but also have risks that need to be addressed. Policymakers and legislators in different countries have introduced regulations on AI. The regulation of AI is a balancing act between ensuring safety and fundamental rights on the one side and driving innovation on the other side.

Keywords:

Artificial intelligence, medicine, medical devices, regulation.

CV:

Current academic positions

2022 - present	University of Zurich, Faculty of Law and Faculty of Medicine Professor of Law, Medicine and Technology
2020 - present	Harvard University Faculty Associate, Berkman Klein Center
2019 - present	Harvard Medical School Affiliated Faculty (Program on Regulation, Therapeutics and Law)
2019 - present	Advising governments and international organizations in areas of expertise

Previous academic and professional positions

2019 - 2022	University of Zurich, Faculty of Law Assistant Professor of Public Law Digitalization
2016 - 2018	Harvard Medical School Postdoc Fellow (Program on Regulation, Therapeutics and Law)

2016 - 2017	Harvard Law School Visiting Researcher (Prof. Dr. Urs Gasser)
2010 - 2015	University of Zurich, Faculty of Law Research Assistant (Prof. Dr. Thomas Gächter)

Further positions: Internships in hospitals (e.g., Memorial Sloan-Kettering Cancer Center, New York) and legal internships in law firms

Education

2021	University of Zurich, Faculty of Medicine Habilitation
2015 - 2017	University of Basel, Faculty of Medicine Dr. med.
2015 - 2016	Harvard Law School LLM (Master of Laws)
2012 - 2016	University of Zurich, Faculty of Law PhD (Dr. iur.)
2015	Federal Office for Public Health Medical Board Examination (Staatsexamen)
2014	Zurich Supreme Court Bar examination (Anwaltspatent)
2008 - 2015	University of Zurich, Faculty of Medicine MD (MMed and BMed)
2007 - 2012	University of Zurich, Faculty of Law JD (MLaw and BLaw)

Awards and grants (selection)

2022	Swiss Science Prize Latsis (most prestigious national award for researchers under 40) awarded for interdisciplinary research in medicine, law, and technology
2021	Eccellenza Grant - Swiss National Science Foundation (SNSF)

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