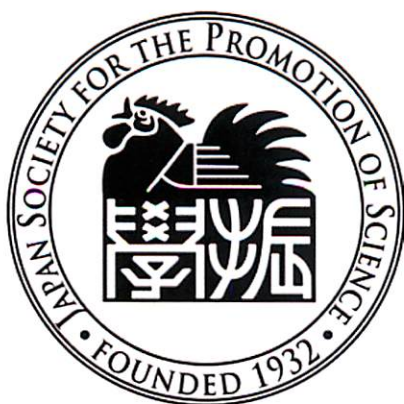


THE JAPAN-US SCIENCE FORUM IN BOSTON
“CHANGING THE WORLD THROUGH
JAPAN’S SCIENTIFIC ENDEAVORS”

~FOOD SCIENCE FOR THE FUTURE:
HEALTH, SUPPLY, AND CULTURE~

NOVEMBER 18, 2017
NORTHWEST BUILDING, HARVARD UNIVERSITY



**Consulate General
of Japan in Boston**

THE JAPAN-US SCIENCE FORUM IN BOSTON
~CHANGING THE WORLD THROUGH JAPAN'S SCIENTIFIC ENDEAVORS~
"FOOD SCIENCE FOR THE FUTURE: HEALTH, SUPPLY, AND CULTURE"

-DATE- Saturday, November 18, 2017

-VENUE- Room B103, Northwest Bldg., Harvard University
52 Oxford Street, Cambridge, MA 02138

-Program-

Moderator : **Kenneth Oye**, Professor, MIT Political Science

12:30pm - Registration

1:00 - 1:20pm Opening Remarks **Kohji Hirata**(Director of JSPS Washington Office)
Rokuichiro Michii (Consul General of Japan in Boston)
Takao K. Hensch(Professor, Harvard University)
Mark C. Elliott (Vice Provost , Harvard University)

1:20 – 2:05pm **Kazuhito Yamashita** (Research Director, Canon Institute for Global Studies)
"Policy Recommendations for Food Security and Sustainable Agriculture"

2:05 - 2:35pm **Anowar Islam** (Associate Professor, Department of Plant Sciences, University of Wyoming)
"Plant Diversity and Physiology for Efficient and Sustainable Agricultural Production: USA, Japan, and Global Perspectives"

2:35 - 3:05pm **Break and Poster Session 1**

3:05 - 3:35pm **Motoko Mukai** (Assistant Professor, Department of Food Science, Cornell University)
"Chemical Safety in Today's Global Market"

3:35 – 4:20pm **Laurent Adamowicz** (Founder and President, EChO)
"Food Science for Healthcare and Public Health"

4:20 - 5:05pm **Theodore C. Bestor** (Director, the Reischauer Institute of Japanese Studies, Harvard University)
"Washoku: Traditional Japanese Cuisine and Culinary Heritage from the perspective of a healthy diet"

5:05 - 5:50pm **Panel Discussion "Policy Challenge in Food"**
Lauren Abda (Branchfood) **Paul Arthur Berkman**(Tufts University)
Hauke L. Kite-Powell (Woods Hole Oceanographic Institution)
Preston Estep III (Veritas Genetics) **Hiroshi Ishii** (MIT Media Lab)
Rokuichiro Michii (Consulate General of Japan in Boston)

5:50 - 6:20pm **Break and Poster Session 2**

6:20 – 6:30pm **Award Ceremony**



REISCHAUER INSTITUTE OF JAPANESE STUDIES
HARVARD UNIVERSITY

branchfood



Foreword

“The Japan-US Science Forum in Boston” was created last year to be held annually in this academic city where vibrant researches are in progress by many Japanese researchers in a variety of fields collaborating with top-rank researchers in the region.

Japan Society for the Promotion of Science (JSPS) is the largest public funding agency for academic activities in Japan. While supporting Japan-based researches by the Grants-in-Aid for Scientific Research (KAKENHI) and other programs, promoting the international academic network is also one of its important missions.

After months of discussion between JSPS Washington Office and Japanese researchers in Boston, this Forum has been devised as a tool to exchange up-to-date researches being conducted by U.S.-based Japanese researchers, JSPS alumni, who once were awarded JSPS fellowship for their research in Japan, JSPS postdoctoral fellows coming from Japan and working in the U.S. and local Bostonian researchers.

The Japan-US Science Forum in Boston features “Changing the World through Japan’s Scientific Endeavors.” After experiencing a rapid economic growth in the post-war period and the “bubble economy” in the late 1980’s, Japan today faces an unprecedented difficulty that are likely to emerge in other developed countries in the near future. By developing solutions for aging societies, population decline, and energy and food issues, Japan is well-positioned to propose and try the world innovative new ways to address shared challenges.

For 2017, we have chosen as our theme “Food Science for the Future: Health, Supply, and Culture.” Through this Forum, researchers from Japan and the U.S. specializing in the natural sciences, social sciences, and humanities come together to tackle one of the most pressing global challenges of today.

Attendance at the Forum are those who are deeply involved in academic activities. Posters related to the topic are also presented during the forum in the atrium.

This Forum is co-sponsored by the Consulate-General of Japan in Boston, and is supported by the Edwin O. Reischauer Institute of Japanese Studies, Harvard University, Branchfood and United Japanese researchers Around the world (UJA). I am deeply grateful to them for their assistance and dedication. I hope all the participants will find the Forum useful and enjoyable.

平田 光司

Kohji Hirata
Director, JSPS Washington Office



Foreword

Together with JSPS, it is our sincere pleasure to welcome you to the 2nd Annual Japan-US Science Forum in Boston, as we are delighted to once again jointly host this inspiring seminar.

With Boston considered the center for world class academic research and innovation, many researchers from a variety of fields are currently here to compete and work in partnership with top-ranked domestic and international researchers from all over the world.

While JSPS is the largest public funding agency in Japan, it highly values and is dedicated to promoting collaboration and networking among international partners.

As such, this Forum was borne from ongoing collective discussions between the JSPS Washington Office and the Consulate General of Japan in Boston. Our goal is for the Forum to serve as a platform for researchers from the US, Japan and other parts of world to make connections and contribute towards the advancement of scientific discussions and achievements.

Last year's topic, "Aging Society" was chosen considering that Japan is the most rapidly aging society in the world with an equally advanced declining population. This was an opportunity for Japan to share its experience and knowledge with the world on this topic. It was also a chance to consider how Science, Technology and Innovation are key elements in tackling this shared social problem that may soon affect many.

We look to 2017, with the focus being, "Food Science for the Future: Health, Supply, and Culture". Researchers from all over the world, specializing in the natural sciences, social sciences and humanities will convene to discuss how we can best improve upon and continue to contemplate various food related issues.

With many thought-provoking lectures to choose from this year, our hope is that you will be inspired to explore beyond your initial thoughts and boundaries. There are many aspects to food related problems that should be considered, including health, nutrition, the influence of culture and so on. One example of this is Japanese cuisine or "Washoku" which plays a significant role in Japan's history and culture and is also recognized for being well-balanced nutritionally. As such, it has been designated by UNESCO as an Intangible Cultural Heritage. We are pleased to introduce a holistic approach to food related issues for the future while also examining some of these elements in more depth.

Fortunate to be held in a city of such vibrancy, attended by so many well respected members of the academic and innovation communities, the Japan-US Science Forum strives to enhance connections between speaker and audience, and particularly amongst researchers and students.

This Forum is supported by Edwin O. Reischauer Institute of Japanese Studies, Harvard University, Branchfood and United Japanese researchers Around the world (UJA). I am deeply grateful for their assistance and dedication. I hope all the participants will find the Forum fulfilling and stimulating as they work towards future endeavors.



Rokuichiro Michii
Consul General of Japan in Boston



Policy Recommendations for Food Security and Sustainable Agriculture

Kazuhito Yamashita

Research Director, Canon Institute for Global Studies

Abstract

Food security consists of affordability and accessibility. A lot of people in some developing countries cannot afford to buy food or get access to food due to the lack of infrastructure even when food arrives at a port. Although Japan is a net food importing country, Japanese can afford to buy food in 2008 when the grain price quadrupled. Japan, however, would suffer from lack of imports when the sea lane is disrupted by a military attack or labour strike at a port of an exporting country.

In such a food crisis, we have no other way than to consume stockpiled food in the short period of time and expand food production by use of agricultural resources such as land.

We have lived on rice which is produced in paddy fields. Contrary to dry farming, paddy fields are immune to replant failure, soil erosion and salinization. We have produced rice every year in more than 3 thousand years. In addition, paddy fields are much more productive than dry farming. That is why the Monsoon Asia has supported the lives of the two-thirds of the world population. Rice production is very sustainable over a long period of time and paddy fields are magnificent agricultural resources.

Japanese agricultural policy has, however, ruined paddy fields by maintaining the acreage reduction program for half a century in order to peg a very high rice price. Japan has lost 1 out of 3.5 million hectares of paddy fields since 1970 when the acreage reduction program was introduced. Now 1 out of 2.5 million hectares of paddy fields is set-aside for the sake of the reduction of rice production. The high rice price has kept a lot of inefficient small-scaled part-time or old farmers in the rice industry so that full time farmers could not expand their farm size by consolidating farmland. 8 out of 10 farmers produce rice but their production is less than 20 % of the total agricultural production in Japan. You can tell how inefficient rice farming is among Japanese agriculture. Agricultural policy has damaged the sustainability of paddy fields to a considerable extent.

But every cloud has a silver lining. The farming population shows a remarkable decline. This enables full time farmers to expand their farm size and deprives the farm lobby of their political clout. For the first time in 70 years the Abe administration finally started the reform of agricultural cooperatives, the strongest political group in the post-war period, which supported high rice price and the acreage reduction program.

The structural reform of agriculture is indispensable or a prerequisite for utilization of high-tech devices or IT/AI. Not small-scaled or part-time farmers but full time farmers can have time and resources for the utilization. Take unmanned operation of tractors by utilization of GPS for example. It can only be made possible on a very large parcel of land. Then we can have a virtuous cycle. Full time farmers have a competitive edge over small-scaled or part-time farmers with the result that more and more land will be leased or sold to full time farmers.

Time will come to do away with the acreage reduction program because small-scaled farmers who have relied on high rice price quit the rice industry. Then rice price would drop well below the international price of the equivalent quality of rice. Japan can begin to export substantial amount of rice with paddy fields fully utilized. This contributes not only to the world-wide food security but to Japanese food security; in the food crisis we consume rice exported in normal times and utilize paddy fields, which have been maintained and fully utilized for the supply of rice domestically and internationally, for the production of high-calorie food such as rice or potatoes. Exportation works as stockpiling without costs. Free trade which the Japanese farm lobby has long detested turns out to be the basis of food security. Japanese agriculture needs TPP indeed.

Kazuhito Yamashita

Present

Research Director, Canon Institute for Global Studies
Senior Fellow, Research Institute of Economy, Trade and Industry, IAA



Education

- 1973 - 1977 Undergraduate Student in the Faculty of Law,
The University of Tokyo, Obtained Bachelor of Law.
- 1980 - 1982 Graduate Student in the Department of Economics
and the Institute of Public Policy Studies, The University of Michigan,
Obtained Master of Applied Economics and Master of Public Administration,.
- 2005 The University of Tokyo, Obtained Ph.D in Agricultural Economics.

Academic Career

- 1977 Joined MAFF
- 1994 Director, GATT Affairs Division, MAFF
- 1995 Counselor, the Japanese Mission to European Union in Brussels, Belgium
- 1998 Director, Rural Development Division, MAFF
- 2001 Director, Administration Division, Food Agency, MAFF
- 2002 Deputy-Director General, International Affairs Department, MAFF
- 2003 Senior Fellow, Research Institute of Economy, Trade and Industry, IAA
- 2006 Director General, Rural Infrastructure Development, Rural Development Bureau, MAFF
- 2007 Deputy-Director General, Rural Development Bureau, Ministry of Agriculture, Forestry
and Fisheries (MAFF) of Japan
- 2008 Senior Fellow, Research Institute of Economy, Trade and Industry, IAA
- 2008 Senior Fellow, Tokyo Foundation
- 2009 Research Director, Canon Institute for Global Studies

My Interest

1. Agricultural Policy Reform and Sustainable Agriculture

Agricultural policies have hindered Japanese agriculture from fully developing international competitiveness. There are three underlying causes to this problem: 1) Japan's farm income support policy, which is excessively dependent on price support policy and less on direct payments; 2) Japan's farmland system, which has focused only on maintaining the small farmers with their own farmland produced through the agrarian reform just after World War II; 3) Japan's agricultural cooperative, which led to the realization of the high price of rice as the most powerful pressure group in postwar Japanese politics and flourished through a shift away from farming, as more farmers took on side jobs. We will make robust recommendations on the agricultural policy reform to make the agricultural sector stronger and more competitive in the world markets.

It is of great interest that Kunio Yanagida, an ex-public-official and a folklore giant, made very insightful and superb policy recommendations for structural adjustment of Japanese agriculture a century ago. But the agricultural politics has ignored them. I will publish a book on this subject in the near future.

Additionally, we will propose measures that would modernize and streamline farm management, through the adoption and utilization of information technology, biotechnology, and business management techniques.

2. Policy Proposals for Trade Negotiations

The Japanese government has eventually decided to go ahead with TPP 11, a TPP without the US. What I solely have repeatedly proposed since last summer has been accepted as a consensus within the government although. Japanese government officials remained obviously reluctant to study what I had proposed until the end of last year.

If a TPP 11 is launched, the US will have to pay a tariff of 38.5% in order to export beef to Japan while Canada and Australia will have to pay a tariff of only 9%. The same thing will happen with wheat, pork, wine, butter, and cheese. Japan concludes an FTA with the EU-a major exporter of wine, pork, cheese, and pasta.

US agricultural products will be ousted from the Japanese market, and associated jobs will be lost accordingly. A similar thing will happen in the markets of other TPP signatories. The US will have no choice but to apply for accession to a TPP 11. Then we could have TPP with the US.

Plant Diversity and Physiology for Efficient and Sustainable Agricultural Production: USA, Japan, and Global Perspectives

Anowar Islam

Associate Professor, Department of Plant Sciences, University of Wyoming

Abstract

Intensification of world agricultural production and striving to maximize economic returns have brought important environmental and social consequences. Along with these consequences, climate variability, volatile markets, and agroecosystem vulnerability to urbanization have become a challenge to producers and researchers in pursuit of developing highly adaptable, productive yet environmentally friendly production practices. Agricultural crops and grasslands play a major role in many nations' economy. However, agricultural efficiency and productivity have been declining. There are a number of factors that contribute to this low efficiency, productivity, and sustainability. Examples include declining plant diversity, reduction of biodiversity, less adapted plant species, monoculture practices, soil degradation, especially soil mining, and rapid urbanization. Many studies conducted locally, regionally, and internationally suggest that maintaining plant diversity with adapted species is important for the productivity, efficiency, and resiliency of agricultural production systems. For instance, a recent extensive review shows that mixtures of species produce an average of 1.7 times more biomass than species monocultures and are more productive than the monoculture. Also, it is shown that, in some experiments, diverse polycultures achieve greater biomass than their single most productive species. The net effect of diversity and the probability of polycultures are more productive than their most productive species which increases through time. This occurs because of the magnitude of complementarity which increases when the experiments are run for a longer time. Also it is shown at eight European field sites, a simulated study by synthesizing grassland communities with different numbers of plant species, that there is an overall log-linear reduction of average aboveground biomass with loss of species. Field studies being conducted at different locations in USA demonstrate that mixtures (binary or polycultures) produce more biomass with high quality compared to monoculture. Similar results are also evident in studies conducted in Japan. There are also positive impacts of mixtures on stand persistence, soil properties and environment, microbial population, and economic returns. Details about plant diversity and physiology and their impacts will be discussed in the presentation.

My Interest

Dr. Anowar Islam's research and outreach activities aim to develop modern and innovative research and outreach programs on Agronomy that includes: germplasm search and evaluation for selection/cultivar development; establishment and best management practices (BMP) for profitable and sustainable crops and livestock production; grazing management and integration with cropping systems; establishment and incorporation of legumes (e.g., alfalfa, sainfoin, birdsfoot trefoil; cicer milkvetch, medics) into the grass systems; alternative/multipurpose use of forages, e.g., bioenergy crops (switchgrass), specialty crops (fenugreek, quinoa, chickpea), small grains; forage nutritive value and seed production. Additionally, he teaches courses (Forage Crop Science, Thesis Research, Dissertation research, Research Apprenticeship, Research in Crops) and advises undergraduate students and mentors graduate students and postdocs.

Anowar Islam



Present

Associate Professor, Department of Plant Sciences, University of Wyoming

Education

- 1986 – 1990 Undergraduate Student in the Faculty of Agriculture, Bangladesh Agricultural University, Obtained B.S.
- 1994 – 1996 Graduate Student in the Department of Agronomy and Soil Science, Institute of Postgraduate Studies in Agriculture, Bangladesh, Obtained M.S.
- 1999 – 2003 University of Sydney, Australia, Obtained Ph.D. (Thesis advisor; Dr. Lindsay Campbell)

Academic Career

- 2002 - 2004 **JSPS Post-Doctoral Fellow** at the University of Miyazaki, Miyazaki, Japan, (Dr. Hirata's laboratory)
- 2004 - 2005 Post-Doctoral Fellow at the Department of Agronomy, University of Sydney, Australia (Dr. Campbell's laboratory)
- 2005 - 2008 Post-Doctoral Fellow at the Samuel Roberts Noble Foundation, Ardmore, Oklahoma, (Dr. Butler's laboratory)
- 2008 – 2014 Assistant Professor, Department of Plant Sciences, University of Wyoming, Laramie, Wyoming, USA
- Jun-Aug 2015 Visiting Professor, Field Science Center for Northern Biosphere, Hokkaido University, Sapporo, Hokkaido, Japan
- Mar-Aug 2016 Visiting Professor, Lethbridge Research Center, Agriculture and Agri-Food Canada, Lethbridge, Alberta, Canada
- 2014 – present Associate Professor, Department of Plant Sciences, University of Wyoming, Laramie, Wyoming, USA

Academic awards

- 2014 Nominated for the Wyoming Agricultural Experiment Station 2014 Early Career Research Achievement Award, University of Wyoming
- 2013 The North West Area Educator Awards, Five Years in Extension Recognition, University of Wyoming Extension
- 2013-2014 JSPS BRIDGE Fellowship Award, Japan Society for the Promotion of Science (JSPS), Tokyo, Japan
- 2011 Early Career Service Award for Professional Excellence in Extension and Research, Epsilon Sigma Phi (ESP), University of Wyoming
- 2002-2004 Australian Academy of Science and Japanese Society for the Promotion of Science Award
- 1998-2002 UPA (University Postgraduate Award) - University of Sydney, Australia
- 2000 James Kentley Memorial Scholarship - The University of Sydney, Australia
- 2000 G.H.S. and I.R. Lightoller Scholarship - The University of Sydney, Australia
- 1994-1996 JICA (Japan International Cooperation Agency) Merit Scholarship - Institute of Postgraduate Studies in Agriculture, Bangladesh
- 1984-1989 University Merit Scholarship - Bangladesh Agricultural University
- 1984-1988 Faculty Scholarship - Bangladesh Agricultural University

Chemical Safety in Today's Global Market

Motoko Mukai

Assistant Professor of Chemical Food Safety

Department of Food Science

College of Agriculture and Life Sciences

Cornell University

Abstract

Global food market is increasingly becoming complex. Melamine adulteration of pet food in North America followed by infant formula in China is a prime example of how chemical safety of food and food ingredients is becoming a global concern, and is an issue that needs to be solved with international collaborations. Some examples of chemical food safety issues, including food packaging migrants, will be discussed highlighting the similarities and differences of regulatory efforts in Japan and the United States.

My Interest

Endocrine disrupting compounds (EDCs) found ubiquitously in food and the environment can cause adverse health effects by interfering with the endocrine system. Exposures to EDCs are often chronic, occur at low concentrations, and the effects may be subtle but can have significant consequences. EDCs target critical stages of human and animal development and can have lasting effect on reproduction, behavior, and endocrine functions, even across multiple generations. There are emerging evidences that some EDCs could act as 'obesogens' by affecting adipogenesis and lipid metabolism. Our laboratory is interested in how these EDCs that are ubiquitously detected in the environment and our diet, affect our health especially in the reproductive system and development of endocrine related diseases such as thyroid diseases and obesity. We use both wildtype and transgenic lines of zebrafish as a model to understand underlying molecular mechanisms of endocrine disrupting effects of EDCs and to screen for toxic compounds in food and the environment.

Motoko Mukai



Present

Assistant Professor
Department of Food Science
College of Agriculture and Life Sciences
Cornell University

Education

1995 - 2001 **DVM**, Azabu University, Kanagawa, Japan
College of Veterinary Medicine
2001 - 2006 **PhD**, University of Illinois at Urbana-Champaign, USA
Department of Veterinary Biosciences, College of Veterinary Medicine

Academic Career

2007 - 2010 Post-Doctoral Fellow at University of California, Davis
Department of Neurobiology, Physiology, and Behavior

2008 - 2010 Veterinary Toxicology Resident at University of California, Davis
California Animal Health and Food Safety Laboratory (CAHFS)
2011- 2013 Senior Research Associate at Cornell University
Department of Population and Medicine, College of Veterinary Medicine
2013 - 2015 Principal Research Scientist at Cornell University
Department of Food Science, College of Agriculture and Life Sciences
2015 - Assistant Professor at Cornell University
Department of Food Science, College of Agriculture and Life Sciences

Academic awards

2010 Certified as Diplomate of American Board of Toxicology
2009 Annual Trainee Award (American Board of Veterinary Toxicology)
2009 Postdoc Travel Award (UC Davis, Postdoctoral Scholars Association)
2006 *Phi Zeta Mu* Chapter Basic Research Award – 1st place, UIUC
2005 Dr. J.O. Alberts Award, UIUC
2004-2005 Interdisciplinary Environmental Toxicology Scholarship, IL
1999-2001 Japanese Food, Drug and Pesticide Safety Center Scholarship, Shizuoka, Japan

Food Science for Healthcare and Public Health

Laurent Adamowicz

Founder and President, EChO - Eradicate Childhood Obesity Foundation, Inc.

Abstract

As background, of all the member countries of the Organization for Economic Co-operation and Development (OECD), Japan has the lowest incidence of obesity among the adult population, with a prevalence of 3.7% based on the latest data released by the OECD in 2017. Conversely, the United States of America have by far the largest share of the population affected: 38% of adults are obese, and among all member nations, the average is now hovering at 19.5% across the OECD, a steady increase since the year 2000.

Obesity, now formally recognized a disease, leads to higher mortality, given its correlation to higher incidence of heart disease, diabetes, and certain types of cancers. Nevertheless, this epidemic affecting approximately one in five adults on earth is not treated as a public health emergency with the level of attention it requires, that of the Justinian Plague of the 6th century AD or of the HIV epidemic of the 20th century. As the lecture delves into broad policy issues and interventions, it also keeps an eye on technological innovations that can offer novel approaches to addressing the obesity epidemic both in adults and children. Front-of-package (FOP) labels have been introduced with success in many countries but none with new advanced technologies, such as augmented reality (AR). What do Nobel Prize winner Yoshinori Ohsumi and video games such as Pokémon Go have in common? They can both contribute to eradicating childhood obesity.

My Interest

Laurent Adamowicz is the Founder and President of EChO - Eradicate Childhood Obesity Foundation, Inc. He is also a member of the Harvard T.H. Chan School of Public Health Nutrition Round Table. Adamowicz received his MBA at the University of Pennsylvania in International Marketing, his MA in Socio-Cultural Anthropology at Columbia University, and was awarded Senior Fellow at Harvard University in Advanced Leadership Initiative.

Laurent Adamowicz founded EChO in 2015. EChO is a public charity based in Cambridge, Massachusetts. The foundation advocates universal nutrition education, from kindergarten to medical schools, and a new food labeling system that it intends to test in public schools in the Boston/Cambridge area. EChO focuses on technology-based education interventions and created the first augmented reality app for public health, called SugAR Poke. He was also the Founder and CEO of Bon'App Inc., a social enterprise designed to combat the global epidemic of obesity through the use of an application that told users what was in their food. Adamowicz has spoken at TED Conferences, with TED Talks entitled "What has your food been eating?" and "Secondary Sugar Kills".

Laurent Adamowicz



Present

Founder and President, Eradicate Childhood Obesity, Inc.

Education

1984	MBA	Wharton School, University of Pennsylvania (International Marketing)
2009	MA	Columbia University (Socio-Cultural Anthropology)
2011	Senior Fellow	Harvard University (Advance leadership Initiative)

Professional Career

1995 - 1996	Co-Founder and President, GC Tech New York City and Paris, France
1998 - 2004	President and CEO, Fauchon Paris, France
2010 - 2015	Founder and CEO, Bon'App, Inc. Cambridge, MA
2015 - present	Founder and President, EChO – Eradicate Childhood Obesity Foundation, Inc. Cambridge, MA
2010 - present	Member, Nutrition Round Table Harvard T.H. Chan School of Public Health, Boston, MA

Washoku: Traditional Japanese Cuisine and Culinary Heritage from the perspective of a healthy diet

Theodore C. Bestor

Reischauer Institute Professor of Social Anthropology, Harvard University

Director, Edwin O. Reischauer Institute of Japanese Studies, Harvard University

Abstract

This lecture will examine some of the characteristics associated with washoku (traditional Japanese cuisine), that correspond to patterns of dietary consumption that may promote healthy lifestyles. Washoku was recognized as an aspect of global cultural heritage by UNESCO in 2013, and within Japan especially it has been promoted as a template for a healthy diet. My presentation will examine some of the things that are considered to contribute to this healthfulness (e.g., locavorism, seasonality, inherent nutritional balance, sustainability), as well as ways in which washoku is promoted to the general public, as through Japan's extensive *shokuiku* (food education) programs.

My Interest

Currently Bestor focuses on Japanese food culture and, in particular, on the globalization of Japanese cuisine and its intense popularity throughout the world, as well as in UNESCO's recognition of Japan's traditional cuisine (washoku) as an item of Global Intangible Cultural Heritage. He conducted research on this topic as a recipient of a Fulbright Senior Fellowship in Japan in the Spring of 2015.

He is the author of *Tsukiji: The Fish Market at the Center of the World*, published in 2003 based on his research over the past 20 years on Tokyo's vast seafood market and its role in Japan's sushi trade. He has been focusing on the ongoing issues on the market's relocation, and is currently working on the second edition of the book. He was a consultant for the documentary "Tsukiji Wonderland" (directed by Endo Naotaro, Shochiku 2016).

Theodore C. Bestor



Present

Reischauer Institute Professor of Social Anthropology and Director,
Edwin O. Reischauer Institute of Japanese Studies, Harvard University

Education

- 1973 Fairhaven College of Western Washington University -- B.A. (Magna cum laude) Anthropology, Japanese Studies, and Linguistics
- 1974-1976 Inter-University Center for Japanese Language Studies, Tokyo
- 1976 Stanford University -- A.M., East Asian Studies
- 1977 Stanford University -- A.M., Anthropology
- 1980-1981 Tokyo Metropolitan University -- Research student in urban sociology
- 1983 Stanford University -- Ph.D., Anthropology
- 2001 Harvard University -- M.A. (hon.),

Academic Career

- 1983-1986 Director of Japanese and Korean Studies Programs, Social Science Research Council
- 1986-1989 Assistant Professor, Department of Anthropology, Columbia University
- 1990-1993 Associate Professor, Department of Anthropology, Columbia University
- 1993-1997 Associate Professor, Department of Anthropology, Cornell University
- 1995-1996 Acting Director, East Asia Program (Title VI National Resource Center)
- 1997- 2001 Professor, Department of Anthropology, Cornell University
- 2001- 2011 Professor, Department of Anthropology, Harvard University
- 2011-Current Reischauer Institute Professor of Social Anthropology, Department of Anthropology, Harvard University
- 2007 – 2012 Chair of the Department, Department of Anthropology, Harvard University
- 2012-Current Director, Reischauer Institute of Japanese Studies, Harvard University

Academic awards

- 2013 Commissioner's Award for the Promotion of Japanese Culture Overseas [文化庁長官表彰], Agency for Cultural Affairs,
- 2010 Distinguished Alumni Award, Western Washington University, Fairhaven College
- 1990 Robert E. Park Award for Urban and Community Studies
- 1990 Hiromi Arisawa Memorial Award for Japanese Studies

Panel Discussion: Policy Challenge in Food

Lauren Abda
Founder and CEO
Branchfood



Hauke L. Kite-Powell
Research Specialist
Woods Hole Oceanographic Institution



Preston Estep III
Founder and Chief Scientific Officer
Veritas Genetics



Hiroshi Ishii
Associate Director
MIT Media Lab



Paul Arthur Berkman
Professor
Tufts University



Rokuichiro Michii
Consul General
Consulate-General of Japan in Boston



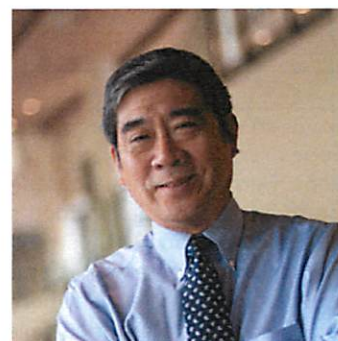
Moderator of the Forum

Kenneth Oye

Professor of Political Science

Professor of Data Systems and Society

Director of the Program on Emerging Technologies (PoET)



Education

1983 Harvard University, Ph.D. in Political Science, with the Edmund Chase Dissertation Prize

1971 Swarthmore College, B.A. in Economics and Political Science, with Highest Honors and Phi Beta Kappa

Academic Career

1975-1976 Harvard University, Teaching Fellow, Government Department and Kirkland House

1974-1975 Harvard University, Kennedy School, Lecturer, Quantitative Methods Program

1976-1979 University of California, Davis, Lecturer, Political Science Department

1979-1980 Brookings Institution, Guest Scholar, Foreign Policy Studies Section

1980-1989 Princeton University, Assistant Professor, Politics Department

1989-1990 Swarthmore College, Associate Professor, Political Science Department

Professional Service

1995-1996 Consultant, Petersen Institute for International Economics on Export Financing Regimes

1996-2002 Consultant, US Government (Trade Policy Coordinating Committee) on Market Windows

2008-2009 Consultant, United Nations (UNIDO), on technology transfer, development and climate change

2010-2013 Member, International Advisory Board, European Union iNTeg-Risk, Stuttgart

2011-2014 Member, National Research Council, Committee on Ethics and Security Applications of Emerging Technologies

2011-2013 Invited Expert, President's Council of Advisors on Science and Technology, Study on Propelling Innovation in Drug Discovery, Development and Evaluation

2011-2014 Member, National Research Council, Board on Global Science and Technology

2012-2013 Consultant, Tufts Clinical and Translational Science Institute, on regulation and drug effectiveness

2013-2016 Director, Policy and Practices, NSF Synthetic Biology Engineering Research Center

2013-2016 Invited Expert, OECD Gene Editing Conference/ EU Synenergene/ US National Intelligence Council/ US National Science Advisory Board for Biosecurity (NSABB)/ UN World Health Organization

1	Name	Timothy Westlake
	Field of Specialization	Plant Pathology & Plant-Microbe Biology
	Current Affiliation	National Cancer Institute
	Poster Title	Identification and characterization of novel plant hormone binding proteins
Abstract		
<p>There is an unprecedented need to increase crop yield to feed the growing global population. Additionally, rapidly aging societies require optimization of crop production to mitigate challenges resulting from an increase proportion of elderly citizens. Furthering the knowledge of plant hormone signaling is necessary for the future development of stress resistant crops to address issues in food security. Plant hormones are small molecules with vital regulatory functions in plant growth and development, as well as in biotic and abiotic stress responses. Hormones elicit a cascade of signaling events, transcription reprogramming, and protein modifications which in turn facilitate responses to environmental stresses. Salicylic acid (SA) is a plant hormone with tremendous importance in abiotic and biotic stress signaling. SA is a phenolic molecule that plays a critical role in the regulation of biochemical processes throughout the plant life cycle. SA signaling is instrumental in coordinating defense response and is a crucial component to plant disease resistance. Utilizing state of the art protein microarrays, we have identified and characterized novel SA-binding proteins in <i>Arabidopsis thaliana</i>.</p>		

●ex-JSPS Fellow to Japan

2	Name	Baofeng Feng
	Field of Specialization	Applied mathematics
	Current Affiliation	The University of Texas Rio Grande Valley
	Poster Title	Self-adaptive moving mesh method for differential equations
Abstract		
<p>There are many mathematical models, related to natural sciences and social sciences such as the nonlinear optics and population models, are differential equations. The numerical simulations of these models have been challenging in mathematics. In this topic, we succeed in designing a very efficient numerical scheme, e.g., the self-adaptive moving mesh method, for some types of differential equations by applying the so-called reciprocal transformation.</p> <p>The example used is the complex short pulse equation which is a new mathematical model for the propagation of ultra-short optical pulses. We firstly obtain an integrable discrete analogue of this equation, which means some exact solutions are available. Then we develop the so-called self-adaptive moving mesh method to simulate the propagation and interactions of optical pulses. The results show this kind of scheme is powerful and has potential for applications in many fields.</p>		

●ex-JSPS Fellow to Japan

-POSTERS-

3	Name	Takehito Kamata
	Field of Specialization	Higher Education
	Current Affiliation	Department of Organizational Leadership, Policy, and Development, College of Education and Human Development, University of Minnesota
	Poster Title	Emerging challenges in cross-national collaborations in food science
Abstract		
<p>Cross-national research collaborations are critical for the advancement of scientific research. One of the emerging challenges in cross-national collaborative research is lack of consistency on research policies and support across nations. In the fields of agriculture, environmental science, food science, life science and others, researchers regard the new rules and regulations of the Convention on Biological Diversity (CBD) as emerging challenges in transferring biomaterials and genetic resources across the nations. Under this treaty, researchers are expected to follow the CBD guidelines and are not able to transfer biomaterials, generic resources, and all organisms across the nations without having a Material Transfer Agreement (MTA). In cross-national collaborative research, researchers have new additional responsibilities such as obtaining mutual agreements, making legal documents, filing a patent application, and other legal related procedures. This poster discusses a case involving a research project on tomatoes that illustrates the compilations of guidelines that are designed for all parties of a cross-national project to follow. Understanding the additional research responsibilities is critical for government and institutional leaders in promoting cross-national collaborations. In order to advance scientific research, government and institutional leaders need to work together to create clear policies and include professional experts who can deal with the legal procedures and support cross-national collaborative research.</p>		

4	Name	Chisayo Kozuka
	Field of Specialization	Nutrition and Metabolism
	Current Affiliation	Joslin Diabetes Center and University of the Ryukyus
	Poster Title	A novel epigenetic mechanism whereby brown rice and its component, γ -oryzanol attenuates preference for dietary fat
Abstract		
<p>Dietary fat is an indispensable factor for tasty palatable foods. We prefer high fat foods and sometimes eat too much them in an addictive fashion, where dysregulation of brain reward system is involved with a similar manner to addiction of narcotics, alcohol and nicotine. Eating healthy is the most critical in the prevention and treatment of metabolic syndrome, but the robust addiction to fat makes it difficult. We here demonstrate that γ-oryzanol, a bioactive substance abundantly contained in brown rice improves high fat diet (HFD)-induced dysregulation of brain reward system, thereby attenuating preference for dietary fat in mice. Dopamine D2 receptor (D2R) signaling in striatum plays a pivotal role in brain reward system. Actually, HFD decreased expression level of D2R in striatum via the increase in DNA methylation of the promoter region of D2R. On the other hand, γ-oryzanol decreases DNA methylation level and increases expression of striatal D2R in a similar manner to that in DNA methyltransferase (DNMT) inhibitor. Consistent with these findings, enzymatic in vitro assays demonstrate that γ-oryzanol inhibits the activity of DNMTs. Our experimental paradigm highlights γ-oryzanol as a promising anti-obesity substance with the distinct property of being a novel epigenetic modulator, which does transform insatiable brain into the satisfied brain (Kozuka C et al. Diabetologia 60:1502-1511, 2017).</p>		

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5	Name	Andrei Alyokhin
	Field of Specialization	Entomology
	Current Affiliation	School of Biology and Ecology, University of Maine
	Poster Title	Insect farming for production of sustainable feeds for aquaculture
Abstract		
<p>Limited availability of land suitable for agriculture presents a serious challenge to producing adequate amounts of food for growing human population. Furthermore, rapid population aging with concomitant decrease in the share of people participating in the workforce creates an additional impetus for increasing productivity in food industries. Aquaculture, with its generally higher feed-to-food conversion rates compared to livestock farming, is a valuable option for production of dietary proteins. Indeed, world aquaculture production has increased from 7% of global fisheries to over 40% since the 1980s. However, it is currently heavily reliant on using fish meal and fish oil originating from wild-caught small fishes, which are both critical to natural ecosystems and edible to humans, for feeding harvestable fish species. In the same time, more than a billion tons of organic by-products, potentially worth \$750B, are discarded annually. Our laboratory is working on developing an alternative aquafeed production technology that relies on biological conversion of organic wastes using black soldier fly, <i>Hermetia illucens</i> (L.) in a contained factory-style facility. The larvae of this species are rich in nutrients, grow rapidly, convert a variety of decaying organic wastes to vermicomposts while suppressing human pathogens and pests, and contain potentially valuable biologically active compounds. Our goal is to create balanced mixtures that both optimize larval growth rates and nutritional contents of resulting insect meal, with an emphasis on obtaining high omega-3 contents. This presentation reports black soldier fly development on different substrates and discusses its implications for producing environmentally sustainable feed for aquaculture.</p>		

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6	Name	Helen Ngo
	Field of Specialization	catalysis, organic and inorganic synthesis and microbiology
	Current Affiliation	U.S. Department of Agriculture – Eastern Regional Research Center
	Poster Title	New Phenolic Branched-Chain Lipids from Two Natural Resources (Vegetable Oils and Natural Monophenols) with Excellent Antimicrobial Properties
Abstract		
<p>Synthesized antimicrobials (preservatives) are commonly used by the food industry to enhance microbial safety and increase shelf-life. However, food and agricultural industries are experiencing an insufficient selection of nontoxic and potent antimicrobial agents to secure the safety and maintain the quality of food products. Some synthetic preservatives may produce harmful by-products and damage the environment. The objective of this study is to develop sustainable products from vegetable oils with desirable chemical properties to target the bioactive applications. A new class of natural phenolic branched-chain lipids was successfully prepared and thoroughly purified to result in up to 95% purity. These phenolic branched-chain lipid products are odorless and should potentially make them appealing for use as food preservatives.</p>		

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7	Name	Takuma Yoshikawa
	Field of Specialization	Applied chemistry
	Current Affiliation	University of Washington
	Poster Title	"EPR Domino": boosting EPR effect of a liposome by encapsulation of a nitric oxide donor
Abstract		
<p>Cancer including tumor is regarded as the disease which can be prevented by healthy eating habits to some extent but still the highest death rate in Japan and the second highest in the United States. As a matter of fact, westernization of eating habits in Japan have been related to the increase of incidence of cancer. As a next cancer treatment, nanomedicines have been widely developed. Polyethyleneglycol-modified liposome (LP) is one of nanomedicines and it can accumulate into tumor tissue via enhanced permeability and retention (EPR) effect. Currently, improving EPR effect is an important issue for treating tumor more effectively. Herein, we focus on the vasodilation induced by nitric oxide (NO). This vasodilation derived from the relaxation of vascular smooth muscle cell is used for increasing blood flow in our bodies. We hypothesized that the increasing blood flow to tumor tissue site-specifically will improve the EPR effect resulting in the enhanced accumulation of LP. In this study, we encapsulated one of representative NO donors called NONOate into LP (NONOate-LP) for tumor-specific NO delivery, and found that about twice of NONOate-LP was accumulated into tumor tissue compared with LP.</p>		

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8	Name	Koichi Sasaki
	Field of Specialization	Applied chemistry, chemical biology
	Current Affiliation	University of Chicago
	Poster Title	Antibody-Recruiting Molecule with a Fc-Binding Peptide Reverses Antibody-Dependent Cell-Mediated Cytotoxicity
Abstract		
<p></p>		

○JSPS Fellow from Japan

9	Name	Takafumi Ando
	Field of Specialization	Energy metabolism/Physiology
	Current Affiliation	Obesity and Diabetes Clinical Research Section, National Institute of Diabetes and Digestive and Kidney Diseases
	Poster Title	The impact of variation in macronutrient composition between meals on daily fat utilization
Abstract		
<p>Background: Food styles and meal content have recently become more complex with improved food availability. Macronutrient composition is therefore subject to large meal-to-meal variation. The prevalence of obesity has also increased recently. Previous studies showed that switching from a high carbohydrate to a high fat diet produces surplus fat because of the dulling metabolic adaptation to fat. We therefore tested whether a larger variation in macronutrient composition between meals induced lower fat utilization.</p> <p>Methods : Fourteen healthy young males performed 3 conditions (R, IC, and IF) in random order under sedentary conditions in a human-calorimeter. The R condition included 3 meals containing the general macronutrient composition consumed by Japanese adults. The IC condition included a high-carbohydrate breakfast, high-fat lunch, and high-carbohydrate dinner, and the IF condition a high-fat breakfast, and high-carbohydrate lunch and dinner. Each condition had a similar daily macronutrient composition although IC and IF had larger variation in macronutrient composition between meals compared with R. Energy expenditure and fat utilization expressed as respiratory quotient (RQ) were assessed by human-calorimetry.</p> <p>Results: There was no significant difference in 24-h RQ between the R and IC conditions. In contrast, 24-h RQ in the IF condition was significantly lower than in the other 2 conditions.</p> <p>Conclusion: The results indicate that a large variation in macronutrient composition between meals does not induce low fat utilization and suggest that other factors, such as the timing of fat intake, are important for altering fat utilization rather than variation in macronutrient composition between meals.</p>		

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10	Name	Hirohito Yamazaki
	Field of Specialization	Biophysics, Nano-optics, Nanotechnology
	Current Affiliation	Northeastern University, Department of Physics
	Poster Title	Label-Free Single-Molecule Melting Kinetics Using a Laser - Heated Nanopore
Abstract		
<p></p>		

OJSPS Fellow from Japan

11	Name	Kazuko Yoshizawa
	Field of Specialization	Global Nutrition, Nutritional Epidemiology
	Current Affiliation	Department of Nutrition, Harvard T.H.Chan School of Public Health
	Poster Title	The possibility of using UN data for global nutrition policy formulation
Abstract		
<p>Objective of this study is to evaluate if United Nations (UN) open access data is useful for nutrition policy formulation. Two case studies were conducted. The first case study evaluated progress of the dissemination of the WHO 6-month exclusive breastfeeding in Cambodia, Bangladesh, Pakistan, India, Sri Lanka, and East Timor in 2011–2014. In 1981 the World Health Assembly adopted the WHO code and currently the exclusive breastfeeding is positioned as a strategy to achieve the Sustainable Development Goals 2030 (SDGs). Analysis by use of data of the Health Nutrition and Population Statistics 2015 and World Health Statistics 2016 found that the increased rate varies by country. The rate in Cambodia increased by 5.6 times which was highest among the countries while no progress in Bangladesh. The analysis suggests that the WHO code and legislation on all of the code did not necessarily lead to improvement of the dissemination. In the second case study, data of the World Development Indicators and Global Development Finance (2012) was analyzed. Multiple regression analysis showed that malnutrition as a dependent variable, statistically significant factors were GDP/capita (95% CI: -0.002, -0.001), immunization (95% CI: -0.370, -0.050), and female literacy (95% CI: -0.306, -0.099) ($R^2=0.54$). Male literacy is highly correlated with malnutrition but it was not significant in the model with female literacy in, and it could be due to a high correlation between them ($r=0.96$). Even though data strategically collected is needed, the UN data might be possible to provide important information for policy formulation.</p>		

12	Name	Yu-Ling Cheng
	Field of Specialization	Chemical Engineering, Global Engineering
	Current Affiliation	Centre for Global Engineering, University of Toronto
	Poster Title	Food and Nutrition Security Engineering Initiative at the University of Toronto
Abstract		

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13	Name	Ryoko Katagiri
	Field of Specialization	Nutritional Epidemiology
	Current Affiliation	Department of Nutrition, Harvard T.H. Chan School of Public Health
	Poster Title	The association between sleep quality and dietary patterns among middle-aged female Japanese workers
Abstract		
<p>Although workers with poor sleep quality are reported to have problems with work performance, few studies have assessed the association between dietary patterns and sleep quality. The study was based on a multicenter survey conducted in 2011 and 2012 in Japan. In the present study, a total of 3,164 Japanese female workers aged 34 to 65 years were analyzed. Dietary intake was assessed using a self-administered diet history questionnaire (DHQ), and subjective sleep quality using the Pittsburgh Sleep Quality Index (PSQI). 148 food items included in DHQ were combined into 31 food groups and four dietary patterns were extracted from them by factor analysis. The association between dietary patterns and sleep quality was examined using multivariable logistic regression models. Four dietary patterns were extracted as follows: (i) "Healthy" pattern which was characterized by high factor loading of vegetables and seaweeds; (ii) "Western" pattern which was characterized by meats and eggs; (iii) "Japanese" pattern which was characterized by rice and miso soup; (iv) "Salt and confectionery" pattern which was characterized by processed fish, pickles and sugar sweetened beverages. Compared with the lowest score of dietary pattern, odds ratio of low sleep quality in the highest quintile of "Healthy" pattern score was 0.62 (95% confidence interval 0.47–0.82). High factor score of "Japanese" pattern and low score of "Salt and confectionery" were likely to associated with high sleep quality, although they were not significant. This finding suggests that healthy dietary pattern may improve sleep quality in Japanese female workers.</p>		

14	Name	Kaoru Kakinuma
	Field of Specialization	Environmental Science
	Current Affiliation	Columbia University
	Poster Title	The linkages among climate change, food security and human migration
Abstract		
<p>Human migration which associate with climate change is one of the biggest issue in the world. It is important to prepare for resettlement that might be associated with climatic events such as flood. However, the relationship between climate and human migration is not clear and it makes difficult to estimate potential human migration in the future. Human migration may be affected by multiple factors, not only climatic and environmental factors but also social-economic, political and food/health condition. Here we focus on historical flood events (Tanoue et al. 2016) and human internal displacement (IDMC 2016) in the world and try to clarify the linkage among climate, human migration and social stability/ food security. We used Human Development Index which is developed by United Nation Development Program as an indicator for social and economic stability and Hunger Index which is developed by International Food Policy Research Institute as an indicator for food security. We found that low social-economic stability/ food security countries may be vulnerable to floods in African countries; many people migrated even in small scale of floods compared with high social-economic stability/ food security countries. These results suggested that even a small scale of flood may have large impacts on low social stability/food security countries, and development of adaptation measures to future climate changes are urgent issues in these countries.</p>		

OJSPS Fellow from Japan

15	Name	Hiroaki Daimon
	Field of Specialization	Social psychology (Group dynamics)
	Current Affiliation	Disaster Research Center, University of Delaware
	Poster Title	"Pay it Forward" for extending the post-disaster altruistic supports in Japan
Abstract		
<p>This research reports the altruistic response (i.e. sending supplies) to the 2011 Great East Japan Earthquake (henceforth, the 2011 Tohoku EQ), especially focusing on the possibilities of extending "pay it forward" volunteerism following a disaster. Japan has a lot of serious disasters (e.g. Earthquake, Tsunami, Typhoon, eruption, etc.), which not only damage to lives and infrastructure, but also cause the shortage of essential supplies such as foods. As the emergence of volunteerism widely since the 1995 Kobe Earthquake in Japan, many volunteers tried to send the supplies, and recently they created a chain of support among survivors, called the "pay it forward" network. Following the 2011 Tohoku EQ, 2004 Chuetsu EQ survivors-turned-volunteers helped the people in Noda village, which suffered from the 2011 Tohoku EQ and Tsunami. Those who were survivors in Chuetsu were also helped by the survivors in the 1995 Kobe EQ. In this research, firstly we demonstrate the determination of the supporters who sent supplies to the affected areas, comparing with those of the other supporter (e.g. donation and volunteering) by Multi-level analysis using survey data (N=1679). Secondly, to investigate the effect of "pay it forward," we reveal that the experience that people were helped by others in past disaster before the 2011 Tohoku EQ positively affected to sending supplies; in contrast, the disaster experience without being helped by others did not. On the whole, "pay it forward" would accelerate the supports increasing psychological debt through the past "being helped" experience.</p>		

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16	Name	Charles Chen
	Field of Specialization	Plant ecophysiology
	Current Affiliation	Department of Biology and Chemistry, Azusa Pacific University
	Poster Title	Towards the rice plant of the future: Leaf physiology of the rice cultivar Takanari under free-air elevated [CO ₂] and varying nitrogen supply
Abstract		
<p>The development of new crop varieties which are well-suited to achieve maximal productivity under future environmental conditions, such as higher atmospheric CO₂ concentrations ([CO₂]), is essential to meet the challenge of ensuring food security in the face of the growing human population and changing climate in the coming decades. A high-yielding indica rice variety (<i>Oryza sativa</i> L. cv. Takanari) has been previously identified as a promising candidate for such breeding, due to its exceptionally high productivity in present and future [CO₂]. However, the performance of Takanari in sub-optimal conditions such as nutrient-poor soils should also be considered. Takanari and Koshihikari (a standard japonica rice variety) were grown in a paddy field under a combination of season-long free-air CO₂ enrichment (FACE, approx. 200 $\mu\text{mol mol}^{-1}$ above ambient [CO₂]) and two nitrogen applications (0 and 8 g N/m²). The photosynthetic gas exchange properties, leaf soluble protein, and pigment content of the two cultivars were compared at varying growth [CO₂], nitrogen applications, and leaf ages across multiple growth stages during the season. Takanari was able to maintain higher flag leaf photosynthesis rates than Koshihikari under nitrogen-deficient conditions by concentrating more N in the flag leaves at the expense of older leaves. This may explain why Takanari still shows enhanced growth in elevated [CO₂] even under nitrogen-limiting conditions. This study deepens our understanding of the robustness of Takanari as a candidate for future rice crop breeding efforts.</p>		

Ⓢex-JSPS Fellow to Japan

17	Name	Sandra Eibenberger
	Field of Specialization	Atomic and Molecular Physics
	Current Affiliation	Harvard University, Department of Physics
	Poster Title	New methods in food analysis using microwave spectroscopy in a cryogenic buffer gas cell
Abstract		
<p>We show the excellent suitability of buffer-gas cooling for chemical analysis using broadband microwave spectroscopy. Our technique has a broad application potential in the area of food analysis.</p> <p>Buffer gas cooling provides a continuous, mixture compatible, solution compatible source of molecules for a variety of experiments. The cold environment is controllable and the cooling process is separate from the production of the gas phase molecules.</p> <p>We demonstrate the analysis of complex molecular mixtures by combining various sources (gas, liquid injection, solid sample) with microwave spectroscopy in a cryogenic buffer gas environment. Our unique combination of measurement techniques allows for a convenient combination of high sensitivity, high specificity and high repetition rates while allowing for the analysis of complex mixtures and still only consume small sample quantities.</p> <p>We propose to extend our established techniques to study food and drink samples.</p>		

18	Name	Shamim Mirza
	Field of Specialization	Nanotechnology
	Current Affiliation	MT Tech Corporation
	Poster Title	Nanosensors for Food Safety for 21st Century
Abstract		
<p>Foodborne pathogens are responsible for the estimated 76 million foodborne illnesses, 325,000 hospitalizations and 5,000 deaths each year in the US alone. The market size for E. coli detection is estimated to grow from \$97.2 million in 2010 to \$240.0 million by the end of the forecast period in 2017. Innovation and highly sensitive technologies is likely to drive this market even faster than estimated. Current laboratory-based detection techniques are sensitive, but it can take up to 24-48 hours to complete an analysis and obtain results. Materials Research Technology Corporation (MR Tech Corp. or MRTC) is developing a new nanosensors that will allow for the real-time monitoring of an automated field-testing kit with sensitivity similar to that of the laboratory-based detection methods would allow for a world-wide change in food safety and regulatory systems. MRTC's sensors are based on carbon nanotubes and half-antibodies, which are used as nanoelectrodes and food pathogens capturing agent, respectively. Food and water are often produced far away from where they are consumed. Processing and packaging occurs regularly at distant/overseas facilities, and food/water may be transported and stored for several days before becoming available at the local market. These sensors can be used for monitoring bacterial activity at the food processing plant, during transportation, and at final destinations.</p>		

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19	Name	Hauke Kite-Powell
	Field of Specialization	Engineering/Economics
	Current Affiliation	Marine Policy Center, Woods Hole Oceanographic Institution
	Poster Title	Ocean Farming for Food and Energy
Abstract		
<p>As the human population and its demand for protein continue to grow over the next century, we will look increasingly to the oceans for food production. Farmed seafood can be a healthy and ecologically sensible source of nutrition and alternative to land-based protein sources. Compared to agricultural land, the world's oceans hold great untapped potential for both food production and the development of plant-based feedstocks for liquid fuel systems. The United States in particular has the opportunity and infrastructure to make more extensive use of its marine resources for food and fuel production.</p>		

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Review:

The jury consists of seven speakers, The Consulate General of Japan in Boston, JSPS Washington Office Director and three planning group members. The jury will review all* submissions and inform the presenters of its decision.

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Criteria:

The jury reviews all submissions based on the following criteria:

Content

- Clear research question
- Method/methodology clearly explained
- Conclusions are clear

Design/Layout

- High readability

Scoring:

Each poster will be judged by individual jury members who are each allotted to use only 10 points for scoring across all the posters. Awardees are chosen based on the sum total of the jury's scoring.

NOTE

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This forum will provide researchers with an opportunity to explore how science and technology can help address a host of social issues that will soon face many other developed countries beyond Japan. We have to examine health and nutrition, and also respect cultural heritage when we consider increasing food production.



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