No. 32 February 2018

International Newsletter

Research Institute for Sustainable Humanosphere, Kyoto University, Japan

=Foreword=

International Research Activities at RISH in 2017

Professor Hiroyuki Yano
Chair of the International Academic Exchange Committee of RISH, Kyoto University

The Research Institute for Sustainable Humanosphere (RISH) at Kyoto University was established in 2004. RISH defines the "humanosphere" as those spheres that support human activities, including the human living environment, the forest-sphere, the atmosphere, and the space environment. RISH was approved as a Joint Usage/Research Center to promote humanospheric science, with academic activities conducted through domestic and international collaborative research programs. We aim to investigate current and future problems of the humanosphere, and to explore innovative technology that will contribute to establishing a sustainable society in harmony with the natural environment.

Before beginning work on the "3rd Midterm Targets and Plans of National Universities" in 2016, RISH reconsidered the roles of its current missions, expanding and reassigning them as follows: "Mission 1: Environmental Diagnosis and Regulation of Circulatory Function"; "Mission 2: Advanced Development of Science and Technology towards a Solar Energy Society"; "Mission 3: Sustainable Space Environments for Humankind"; "Mission 4: Development and Utilization of Wood-based Sustainable Materials in Harmony with the Human Living Environment"; and, "Mission 5: Quality of the Future Humanosphere", which aims to create healthy and sustainable living environments by developing practical applications for research results. We also set up a "Humanosphere Asia Research Node" in Indonesia to strengthen the hub functions of international collaborative research, and foster the work of people who sustain and expand Humanosphere Science toward global-scale solutions.

One of the noteworthy academic activities this year was the Humanosphere Science School (HSS) 2017, jointly held by the Indonesian Institute of Science (LIPI) and RISH beginning November 1 in Bogor, Indonesia, as reported by Dr. Yanagawa in this newsletter. The 360th Symposium on Sustainable Humanosphere and the 7th International Symposium for Sustainable Humanosphere (ISSH) were held together with HSS 2017. A total of 199 attendees from 35 institutions participated in discussions of various and exciting interdisciplinary topics, reflecting the forefront of global research, and networking to ensure improvements of the humanosphere. The Asia Research Node supported 15 master course students, 8 PhD course students and 4 post-doctoral researchers, for a total of 27 young scientists who took part in the school and symposium.

To promote international collaboration, we have signed 22 cooperative Memoranda of Understanding (MOU). In 2017, we added 1 MOU with National Chung Hsing University, Taiwan, and extended the MOUs with the College of Forest and Environmental Sciences, Kangwon National University, Korea, Faculty of Civil Engineering and Planning, the Islamic University of Indonesia, Indonesia, and the Zhejiang A&F University, China. Our counterparts are spread out over 11 countries, with 18 Asian, 3 European, and 1 North American regions.

The academic exchange committee of RISH continues to encourage more productive partnerships to strengthen the quality and effectiveness of research on global issues.

=International Activity Report=

The HSS 2017/7th ISSH Report

Assistant Professor Aya Yanagawa
RISH, Kyoto University

The Research Institute for Sustainable Humanosphere (RISH), together with the Indonesian Institute of Sciences (LIPI), has sponsored the Humanosphere Science School (HSS) since 2008. HSS has served researchers, enterprises, and the public by sharing scientific knowledge, exchanging research approaches, and expanding both national and international collaboration in the field of Humanosphere Science. This year, HSS 2017 was held in Bogor, Indonesia, from October 31–November 3, 2017, together with its satellite symposium, the 7th International Symposium for Sustainable Humanosphere (ISSH) and two Asia Research Node (ARN) workshops. ARN is a new project at RISH, intended to strengthen international collaborative research and foster innovation. The main theme for this year's conference was "Advances in Science and Technology for the Future of a Sustainable Humanosphere".

Sixteen distinguished Keynote Speakers were invited to HSS 2017/7th ISSH. Their lectures covered many fields of science. Dr. Chartchai Khanongnuch (Chiang Mai University, Thailand), for example, discussed traditional agricultural methods in Thailand, and recent trials with local farmers to develop efficient techniques for converting biomass wastes into bio-ethanol using rice and cassava. Thailand is known as an agricultural-based economy, and biomass wastes after harvest have become an important bio-energy source. Prof. Yoshiharu Omura from RISH, on the other hand, talked about the space chorus. He demonstrated the whistler-mode chorus emissions in space using a sound device. By comparing the sound with bird songs in the deep Indonesian forests, he made audiences aware of the mysteries in the Humanosphere through science.

HSS 2017/7th ISSH was sandwiched between two ARN workshops. In the ARN Biomaterials Workshop on October 31, seven RISH scientists visited the Research Center for Biomaterials of LIPI in Cibinong. They exchanged the most recent knowledge from their research activities, and discussed future directions/collaborations. The JASTIP/ARN Bioresources and Biodiversity Workshop was held in Bogor on November 3. It was aimed more toward education, and therefore had two sections: a tour of the Bogor Botanic Garden, and the symposium. Hence, participants were able to touch the

LIPI chair, Dinie san (left) and the writer, Yanagawa (right)

real bioresources of one ASEAN country, Indonesia, and witness first hand the importance of its conservation in the morning tour; they then learned about the social outlines in the afternoon symposium.

Overall, the most marked thing about HSS 2017/7th ISSH was the increased role of education. Twenty-seven young scientists from RISH presented their research, including 15 MA and 8 PhD students. It was wonderful to watch these young scientists keenly discuss the roles and functions of science in the sustainable Humanosphere. About 200 participants from 35 institutes attended the event, which was deemed a great success. With sincere gratitude to all participants and organizers, we sincerely hope that our work can further our understanding of the differences and difficulties in the world, and accelerate the formation of a Sustainable Humanosphere on this precious planet.

Group photo of HSS 2017/7th ISSH in Indonesia

In Bogor Botanic Garden

=Overseas Visiting Scholar=

Research Activities at RISH on Environmental Friendly Biocomposites

Professor Mohammad Iftekhar Shams
Khulna University, Bangladesh

For the last couple of years, I have concentrated on how formaldehyde-free biocomposites can be manufactured from agricultural residues. This interest arose during my last visit to Kyoto University as a JSPS Invitation fellow. I have known Dr. Umemura of Kyoto University for a few years. He has strong background in the field of bio-adhesives, and has developed some outstanding materials reinforced with natural-based adhesives.

The detrimental qualities of the formaldehyde-based resins commonly used in wood-based industries have raised inevitable concerns, increasing interest in the use of natural and renewable adhesives for development of eco-friendly biocomposites. Citric acid, derived from lime and lemon, is an organic polycarboxylic acid with three carboxyl groups, and can act as a binder of lignocellulosic biocomposites. Citric acid performs as a cross-linking agent and reduces the hygroscopicity of biocomposites, along with providing better dimensional stability by reacting with hydroxyl groups of lignocellulosic materials.

Jute (*Corchorus capsularis*) is the one of the most promising agricultural resources in Bangladesh. The stalk of jute consists of an outer bast layer and an inner core. Chemically, jute stick is a lingo-cellulosic raw material, and composed of high amounts of hemicelluloses. In addition, the stick is light in weight with a density of only about 0.2g/cm^3. The estimated amount of jute stick available in Bangladesh per annum is about 3,000,000 tons. Most of it is used for domestic purposes such as fuel and temporary fencing.

During a three-month stay from July 5–October 4, 2017, I attempted to develop a suitable method for producing cross-banded jute stick composites using citric acid. Jute sticks were immersed into different concentrations of citric acid (20–60 wt%), arranged in alternate directions, followed by hot pressing at different temperatures. Citric acid bonded boards demonstrated high mechanical properties and excellent dimensional stability. This was because the strong reaction between carboxylic groups of citric acid and hydroxyl groups of jute stick formed ester-linked groups that exhibited hydrophobic tendencies and strong bonding. It is expected that citric acid bonded jute stick board will show good potential for use as a structural material in furniture, flooring and walls.

In addition, I got the opportunity to join the 2nd ARN (Asia Research Node) symposium, held in Kyoto, during my tenure. I delivered an invited talk regarding my recent research and met many scientists from Indonesia, China, Malaysia and Japan. I gained a lot of experience and knowledge from this symposium, which helped me envision the direction of my future research. During my tenure, I visited the Department of Agriculture at Kyushu University, and participated in detailed discussions of the recent trends in bio-based nanofiber research. The warm welcome and friendly attitude of the faculty and students were truly appreciated. I also visited Shizuoka University and Tokushima University and delivered lectures regarding my recent research, and was introduced to their opinions concerning the future direction of bio-based composites research.

Finally, I would like to thank Dr. Kenji Umemura for his cordial invitation, and to say that I have had a great time with all the members of the Sustainable Materials lab. Special thanks to Dr. Sukma who was very kind to help me at all times with my research, and to Ms. Ami Tani who was always ready to help me in the office, or in my daily life. I hope and expect that our collaboration will continue and grow in the future.

The 2nd ARN symposium at Uji campus

=Overseas Visiting Scholar=

Catalyzed-Glycerolysis for Biorefinery of Bagasse

Associate Professor Sadat Mohamed Rezk Khattab
Al-Azhar University, Egypt

It is an honored for me to be invited to RISH, Kyoto University. Actually Japan is becoming my second country and Kyoto University is also my second university where I have been got scholarship for studying PhD "Joint supervision programs" for two years, then another scholarship for postdoc for 6 months IAE, Kyoto. Last year I was honored to be invited as distinguished senior visiting lecturer in IAE. So far, most of my experimental data and researches were achieved in collaboration with Kyoto University where my main duties in my university is for teaching and training undergraduate students. During each departure from Japan, I am vowing to return back and actually each time I grabbed it. This sabbatical visiting, April 1, 2017 to Sep.30, 2017, is one of the highlighted points in my research career where it may be led to further collaboration with RISH and also development in the academic research point.

One of these missions of RISH is to solve the current and future problems of humanosphere through innovative technologies and develop an efficient utilization scenarios for abundance of lignocellulosic biomass to produce biofuels and chemicals especially with industrial modernization, where a serious concerns have developed in many countries over the worldwide growing demand and uncertainty of petroleum supplies required for transportation, heating, and industrial processes. Furthermore, excessive use of fossil fuels has resulted in global warming and greenhouse gas emissions.

On the other hand, recently much production of glycerol from industrial process especially biodiesel production drops down the prices of glycerol, which threatens the sustainability of these industries, prompted us to utilize such surplus and low commercial value of crude glycerol for glycerolysis of biomass and thereafter used for feeding yeasts during fermentation process. Furthermore, there is an increasing interest to use electromagnetic waves of microwave during pretreatment of biomass where Professor Takashi Watanabe is leading Biomass Conversion lab to many very interesting research points such as Lewis acid catalyst, which has magnificent effect when combine glycerol in microwave during pretreatment of bagasse, which reflected in decomposed ratio to 45–80 % of original bagasse.

Although we used a previous constructed recombinant xylose fermenting *Saccharomyces cerevisiae*, which ferment all saccharified sugars with efficiency reached 100 % of conversion rate to bioethanol but, development of *S. cerevisiae* to utilize glycerol was also initiated in order to improve diauxic growth phase toward xylose and glycerol and considerable work in this regard was achieved. In addition, biorefinery processes for lignin-derived value-added products were also initiated after glycerolysis for produce fine chemicals and bioactive compounds.

I would like to express my sincere thanks to Professor Takashi Watanabe for gave me this fruitful opportunity of collaboration. Not forgotten to thank all member of biomass conversion lab for endless helping during the staying in Kyoto, especially office administrators Mrs. Momoko KAGE, and Mrs. Miyuki TSUJI. Deep thanks for Dr. Satoshi OSHIRO, Dr. Qu Chen for their continuous helping and the great discussion during some experimental procedures. Finally, I would like to acknowledge the thanks to committee of RISH and all the staff members including office administrators and the sponsors for the visiting.

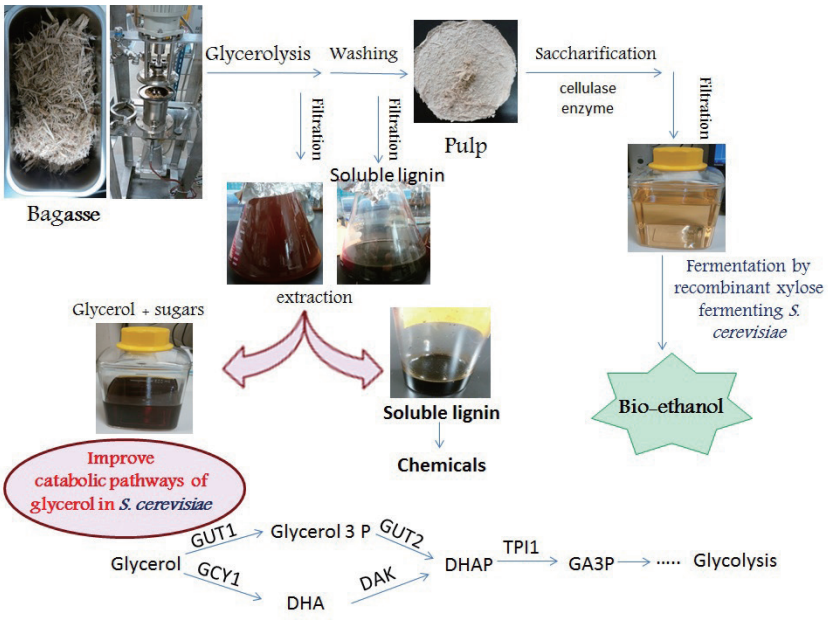

Fig.1. Schematic diagram of this research

=Overseas Visiting Scholar=

Research at RISH on the topic of Wave-mode conversion in space plasmas

Assistant Professor Miroslav Horký
Czech Academy of Sciences, Czech Republic

My research within RISH was focused on numerical simulations of conversion processes between electrostatic and electromagnetic wave modes in plasmas in presence of density gradient. Such density gradients occur within Earth's magnetosphere, for example in plasma pause region. The conversion processes on density irregularities are studied since 70' but still they are not well understood.

I was invited to RISH by prof. Yoshiharu Omura in the spring 2016. After successful evaluation of proposed research I received visiting position from 1st October 2016 to 31st March 2017. Before my arrival I prepared some modifications to the simulation code KEMPO2, thus in the time of my arrival to Japan some things were already prepared. After my arrival I worked on another code modification to have code fully suitable for proposed simulations. These modifications included generation of particles with density gradient, improved diagnostics, etc. First preliminary results were presented at the 140th SGEPSS meeting held in the end of November at Kyushu University in Fukuoka. After the conference we continued in development of diagnostics procedures to receive more detailed information about studied system. After the conference I also started to help with advising D1 student Takeshi Nogi who works on numerical simulations of oblique whistlers. All code developments were finished in the end of January and in February we started to analyze data from performed simulations.

In our simulations we simulated plasma with Gaussian density profile. In the dense region we have had a population of electrons with ring velocity distribution function. This velocity distribution triggers ring instability resulting to generation of electrostatic electron Bernstein modes. We observed propagation of these usual Bernstein modes to the region with lower density and their conversion to the electromagnetic L-O mode. I gave a talk on these simulation results at Hideyuki Usui's group at the Kobe University and the paper on these results was submitted to the Physics of Plasmas in the autumn. We have also data from extended simulations, thus the collaboration will continue and more papers are expected in this year.

Staying and working within RISH was the greatest opportunity in my academic career and I am very thankful for the possibility of working at the prestigious Kyoto university. I would like to thank to prof. Omura for hosting me and for his kind behavior resulting to fruitful discussions. Also I have to thank to Ms. Hiroko Nitto, prof. Omura's assistant, who helped me with managing all administration procedures. At last but not least I have to thank to students at prof. Omura's group and all friends I met here. All of them made my stay in Japan very pleasant. Since the collaboration with prof. Omura will continue I hope that I will have another opportunity to visit RISH in the future.

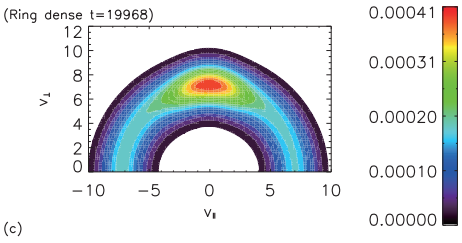

Fig.1. Velocity distribution of ring electrons in the end of simulations. It shows high anisotropy due to the ring instability damping.

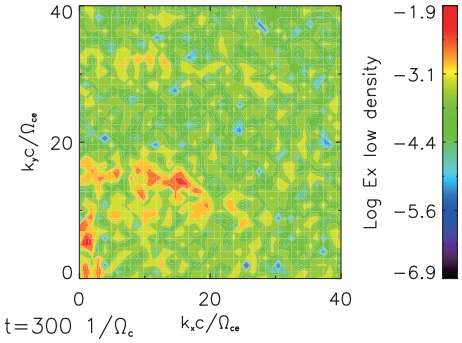

Fig.2. Wavenumber kx-ky spectrum in for the electromagnetic component Ex showing oblique modes of propagation.

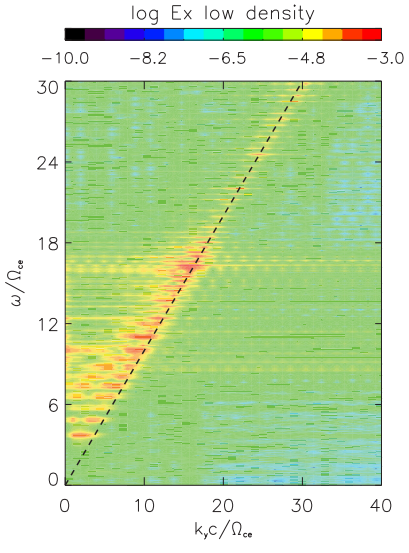

Fig.3. Frequency-wavenumber spectrum of Ex component in low density region. It shows harmonics in cyclotron frequency which are in agreement with measured data.

=RISH Mission Research Fellow=

Numerical modeling of magnetic reconnection in space

Dr. Seiji Zenitani

Phenomena like solar flares and auroras are direct/indirect consequences of "magnetic reconnection" in space. These reconnection events abruptly release energy as they change the topology of magnetic field lines. In particular, in near-Earth space, reconnection takes place in tenuous plasmas. These plasmas are so tenuous that the charged particles (ions and electrons) rarely collide with each other, instead moving in very complex ways due to the electric and magnetic fields. Furthermore, as they move, the particles carry the electric current that in turn changes the electromagnetic field. The entire reconnection system becomes highly complex, and is very difficult to predict.

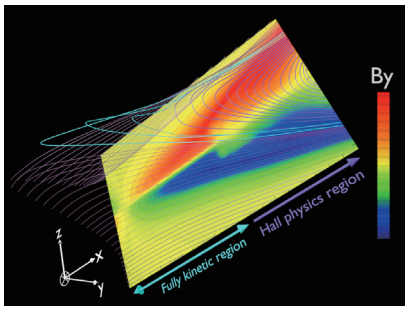

Fig. 1. Magnetic field lines in our simulation

I study the physics of magnetic reconnection in space by means of supercomputer simulations. I usually use a particle-in-cell (PIC) code, which simultaneously solves the time evolution of the electromagnetic field and the motions of a billion virtual particles. Fig.1 shows a typical result of our PIC simulation. The lines in the figure indicate the magnetic field lines. Initially, the magnetic field in the top half has the opposite polarity to the field in the bottom half. Then, the field lines are cut and reconnected on the left side by the reconnection process. Although I do not describe this in detail, since ions and electrons respond differently to the electromagnetic fields, the reconnected field lines are often dragged in the out-of-plane direction, resulting in a complex 3-D structure. PIC simulations have also revealed other interesting plasma signatures. Analyzing simulation data, I try to understand the underlying physics and observable signatures of the reconnection process.

In addition, I am a Japanese member of NASA's Magnetospheric Multiscale (MMS) project, a four-spacecraft mission to probe plasmas in near-Earth space at ultrahigh resolutions. Launched in 2015, the spacecraft have been observing reconnection events at the magnetopause, where the solar wind interacts with the Earth's magnetic field at the dayside of the Earth. This past summer, the MMS started to observe the nightside space of the Earth, which is probably the best place to study magnetic reconnection in an ideal configuration. Scientists expect that the MMS will observe many reconnection events in next few years. In close collaboration with observation scientists, cross-comparison of MMS data and our PIC simulations will enable us to validate numerical models and to understand the reconnection process much better. The next few years will be exciting years for reconnection physicists!

=RISH Mission Research Fellow=

Method for estimating net ecosystem production of forest

Dr. Tran Van Do

In recent years, ecologists have focused on estimating net ecosystem production (NEP) in order to understand the role of forests in managing atmospheric carbon, a major concern in research and debates on global warming. NEP is a fundamental property of ecosystems. It is defined as the difference between the amount of organic carbon fixed by photosynthesis in an ecosystem (gross primary production) and total ecosystem respiration (the sum of autotrophic and heterotrophic respiration). The eddy-covariance method is widely used to calculate NEP from ecological inventories of various carbon compartments (Fig.1) and biometric-based flux measurements. Biometric-based NEP is usually described as the balance between net primary production (NPP) and heterotrophic respiration (decomposition of organic matter by microbes and soil fauna) in an ecosystem.

Five components are needed to estimate NEP: (1) annual living biomass increment (ΔM - the difference of living biomass between t_i and t_j); (2) coarse root ($\varphi > 2$ mm) increment (ΔCr); (3) aboveground litterfall (Lf); (4) fine root ($\varphi \leq 2$ mm) production (Fp); and (5) heterotrophic respiration (RH).

ΔM estimation has been widely carried out using allometric models of stem diameter and stem biomass. Lf is estimated basing on the litter trap

technique. Fp is estimated based on mass-balance models. RH is measured using the open-flow IRGE method. ΔCr is estimated based on the relationship between coarse root biomass (CRB) and aboveground biomass (AGB): $CRB = 0.489 \cdot AGB^{0.89}$. However, ΔCr may produce an underestimation, as one cannot collect all the coarse roots of sampled trees to establish allometry. Therefore, a new and simpler method that does not require destructive sampling is of interest.

We propose a new method for estimating ΔCr based on the relation between root diameter (φ), root length (L), and root biomass (W_r) by model $W_r = \alpha \cdot (\varphi^2 \cdot L)^\beta$ (α and β are constant). Soil blocks are sampled (e.g., 1×1×1 m) to collect coarse roots; measurements of φ, L, and W_r are then conducted to establish the model. Other soil blocks are used for measuring φ_i and L_i of roots inside those blocks at time t_i, then the filling soil in the blocks for natural growth of roots. At time t_j, soil is removed again to re-measure φ_j and L_j. From the established model, φ_i, L_i, φ_j and L_j, W_r at time t_i and t_j can be determined for a unit of the forest floor surface area, and ΔCr between time t_i and t_j can be calculated. This method does not require destructive sampling of sampled trees and can be applied in any forest type with very simple equipment and facilities.

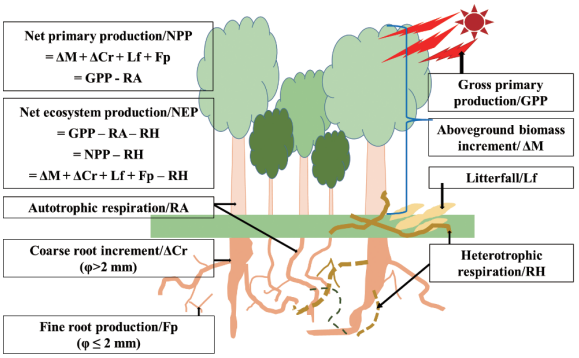

Fig. 1. The biometric based NEP calculation.

=RISH Mission Research Fellow=

The identification of antiviral compounds from plant biomass

Dr. Ryota Ouda

Pyroligneous acids (PAs), also called wood vinegar, are the crude condensate of smoke produced through carbonization, which contains pyrolyzate of cellulose, hemicelluloses and lignin. Wood and bamboo PAs are used for sterilization, food additives, smoke flavoring and antimicrobial agents, indicating rich physiologically active substances. Interestingly the chemical composition of PAs depends on the original wood species. For example, the chemical composition of moso bamboo (*Phyllostachys pubescens*) PAs is different from that of madake bamboo (*phyllostachys bambusoides*), despite their close phylogenetic relationship. My goal is to find suitable wood and bamboo species, as well as efficient degradation conditions of lignin, to obtain physiologically active substances.

In 2010, Miyagi prefecture, Japan, experienced an outbreak of foot-and mouth disease, caused by foot-and mouth disease virus (FMDV). Although the fatality rate was low, all infected animals were sacrificed because of the disease is highly contagious. The result was a decline in productivity. This indicates the importance of protection from FMDV. Because PAs are known to be safe for the environment, humans, and animals, I hypothesized they would be good candidates for protection against FMDV infection.

In this study, I attempt to identify the antiviral compounds from wood and bamboo PAs, in collaboration with the Lanzhou Veterinary Research Institute, which is studying FMDV in China. My aim is to apply PAs as protection against infectious diseases.

In addition, I am investigating whether PAs affect host immune responses. Some reports have shown that PAs have the potential to modulate immune responses. For example, cresol derived from moso bamboo PAs inhibits inflammasome activation through reactive oxygen species production and inactivation of protein kinase C-α/δ. However, little is known about whether PAs modulate the expression of type I interferon (IFN). IFN is rapidly expressed upon viral infection, and affects neighboring cells to show antiviral effect. Although IFN is an important antiviral protein, too much IFN expression is harmful to the body. Indeed dysregulation of IFN causes autoimmune disorders.

In this study, I try to identify the compounds from wood and bamboo PAs that modulate the expression of IFN with the aim of applying PAs as a medicine for autoimmune disorders.

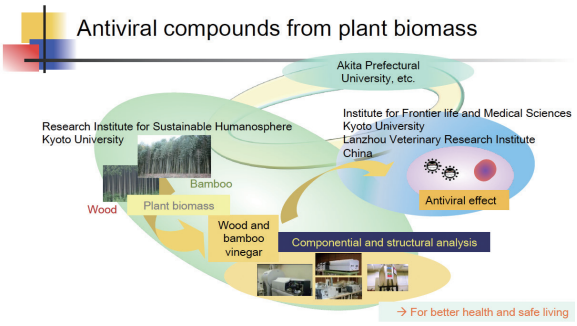

Fig.1. Schematic diagram of this research

List of International MOU in FY 2017

No.	Institution	Country
1	Nanjing Forestry University	China
2	Centre de Recherches sur les Macromolécules Végétales, Centre National de la Recherche Scientifique (CNRS)	France
3	National Institute of Aeronautics and Space of the Republic of Indonesia (LAPAN)	Indonesia
4	School of Biological Sciences, Universiti Sains Malaysia	Malaysia
5	VTT Technical Research Centre of Finland	Finland
6	Zhejiang A & F University	China
7	College of Atmospheric and Geographic Sciences, University of Oklahoma	U.S.A.
8	National Atmospheric Research Laboratory (NARL), Department of Space, Government of India	India
9	Institute of Mathematics and Informatics, Bulgarian Academy of Sciences	Bulgaria
10	Southwest Forestry University	China
11	College of Planning and Design, National Cheng Kung University	Taiwan
12	Faculty of Forestry, Tanjungpura University	Indonesia
13	Research Center for Biomaterials, Indonesian Institute of Sciences (LIPI)	Indonesia
14	Faculty of Science, Chulalongkorn University	Thailand
15	University of Riau	Indonesia
16	College of Forest and Environmental Sciences, Kangwon National University	Korea
17	Research Institute for Human Settlements, Agency for Research and Development, Ministry of Public Works	Indonesia
18	Faculty of Civil Engineering and Planning, Islamic University of Indonesia	Indonesia
19	Material Science and Engineering College, Northeast Forestry University	China
20	Faculty of Mathematics and Natural Sciences, Andalas University	Indonesia
21	Indian Institute of Geomagnetism (IIG)	India
22	National Chung Hsing University	Taiwan

Visiting Professors of RISH in FY2017

	Name and Affiliation	Research Title	Period
1	Benjamin Fong Chao Distinguished Research Fellow, Institute of Earth Sciences, Academia Sinica, Taiwan	Using GRACE satellite time-variable gravity to study the tropical Pacific Ocean mass transports in relation to ENSO under global climate change	29 March 2017 – 30 June 2017
2	Sadat Mohamed Rezk Khattab Associate Professor, Botany and Microbiology Department, Al Azhar University, Egypt	Bioethanol production from lignocellulosics using gene-engineered microbes	1 April 2017 – 30 September 2017
3	Mohammad Iftekhar Shams Professor, Forestry and Wood Technology Discipline, Khulna University, Bangladesh	Development of Self-Bonded Composites from Jute (Corchorus capsularis) Stick	5 July 2017 – 4 October 2017
4	Bharati Kakad Reader, Indian Institute of Geomagnetism, India	Wave-wave interaction process and associated resonant particle dynamics in the Earth's magnetosphere	1 October 2017 – 31 December 2017
5	Danny Summers Professor, Department of Mathematics & Statistics, Memorial University of Newfoundland, Canada	Nonlinear wave growth effects on radiation belt particle fluxes	5 January 2018 – 4 July 2018
6	Laigeng Li Professor, Institute of Plant Physiology and Ecology, Chinese Academy of Sciences, China	Metabolic engineering of lignocellulose biosynthesis towards sustainable biomass production	1 February 2018 – 30 April 2018
7	Vishnu Thonglek Assistant Professor, Faculty of Engineering, Rajamangala University of Technology, Thailand	Theoretical research of micro/nano bubbles for agricultural applications	1 March 2018 – 31 May 2018

International Symposium in FY2017

Theme	Place	Period
The 15th Workshop on Technical and Scientific Aspects of MST Radar (344th RISH symposium)	National Institute of Polar Research, Tokyo, Japan	27 – 31 May 2017
International Symposium on Utilization of Agricultural Wastes in Anhui (348th RISH symposium)	Héféi Shì, Ānhuī, China	5 June 2017
The 2nd Asia Research Node International Symposium on Humanosphere Science (343rd RISH symposium)	Uji Campus, Kyoto University, Japan	19 – 21 July 2017
International Symposium on Earth-Science Challenges (ISEC) The 5th Summit between the University of Oklahoma and Kyoto University (349th RISH symposium)	Uji Campus, Kyoto University, Japan	1 – 5 October 2017
Fire Ant Workshop 2017 (355th RISH symposium)	Campus Plaza Kyoto, Japan	10 October 2017
Humanosphere Science School 2017 (HSS 2017) (360th RISH symposium)	Bogor, Indonesia	1 – 2 November 2017
The 2nd SATREPS Conference Producing Biomass Energy and Material through Revegetation of Alang-alang (*Imperata cylindrica*) Fields (The 8th Flagship Symposium of Tropical Plant Biomass) The 3rd Sustainable Development Seminar (358th RISH symposium)	Uji Campus, Kyoto University, Japan	16 – 17 November 2017
The 3rd International Seminar of Nano bubble Science Program Sponsored by Research Institute for Sustainable Humanosphere, Kyoto University (361st RISH symposium)	Graduate School of Agricultural and Life Sciences, The University of Tokyo, Japan	6 – 8 December 2017
Wood Culture and Science 17 (346th RISH symposium)	Uji Campus, Kyoto University, Japan	18 – 20 December 2017

The Committee of International Academic Exchange
Hiroyuki Yano (Chair), Tomohiko Mitani, Chin-Cheng Yang, Yuki Hasebe

The Committee of Public Relations
Kozo Kanayama (Chair), Yusuke Ebihara, Toshimitsu Hata, Yoshimasa Kishimoto, Akihisa Kitamori, Rika Kusakabe, Hajime Sorimachi, Mayu Takeda, Yuki Tobimatu
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