e-ASIA Joint Research Program
Final Report

1. Project title: 「Advancement of Asian Cassava Molecular Breeding by Cutting-edge Technologies」


3. Research Team:

Country 1 (Japanese) team (up to 6 people including the Principal Investigator)
Funding period: Jan. 1, 2013 ~ Mar. 31, 2016
Total Funded Amount (in Local Currency): 28.8 million Japanese Yen

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Affiliation</th>
<th>Role in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>Motoaki Seki</td>
<td>Team Leader</td>
<td>RIKEN Center for Sustainable Resource Science (CSRS)</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Yoshinori Utsumi</td>
<td>Research Scientist</td>
<td>RIKEN CSRS</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Tomonari Hirano</td>
<td>Visiting Scientist</td>
<td>RIKEN Nishina Center for Accelerator-Based Science</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Akihiro Matsui</td>
<td>Research Scientist</td>
<td>RIKEN CSRS</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Maho Tanaka</td>
<td>Technical Staff</td>
<td>RIKEN CSRS</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Chikako Utsumi</td>
<td>Technical Staff</td>
<td>RIKEN CSRS</td>
</tr>
</tbody>
</table>

Total number of participants including students: 10

Country 2 (Vietnamese) team (up to 6 people including the Principal Investigator)
Funding period: Jan. 1, 2013 ~ Dec. 31, 2015
Total Funded Amount (in Local Currency): 2,590,000,000 VND

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Affiliation</th>
<th>Role in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>Ham Huy Le</td>
<td>Director</td>
<td>Agricultural Genetic Institute (AGI)</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Dong Van Nguyen</td>
<td>Director</td>
<td>National Key Laboratory, AGI</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Vu Anh Nguyen</td>
<td>Deputy Director</td>
<td>National Key Laboratory, AGI</td>
</tr>
<tr>
<td>Collaborator</td>
<td>Thu Anh Vu</td>
<td>Technical Staff</td>
<td>National Key Laboratory, AGI</td>
</tr>
</tbody>
</table>
### Collaborators

<table>
<thead>
<tr>
<th>Collaborator</th>
<th>Name</th>
<th>Position</th>
<th>Affiliation</th>
<th>Role in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Huong Thi Ton</td>
<td>Technica l Staff</td>
<td>National Key Laboratory, AGI</td>
<td>Cassava transformation</td>
</tr>
<tr>
<td></td>
<td>Quynh Ngoc Le</td>
<td>Technica l Staff</td>
<td>National Key Laboratory, AGI</td>
<td>Cassava transformation</td>
</tr>
</tbody>
</table>

Total number of participants including students: 10

### County 3 (Thai) team (up to 6 people including the Principal Investigator)

**Funding period:** Oct. 1, 2012 - Sep. 30, 2015

**Total Funded Amount (in Local Currency):** 2,000,000 Baht

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Affiliation</th>
<th>Role in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jarunya Narang ajavana</td>
<td>Associate Professor</td>
<td>Faculty of Science, Mahidol University</td>
<td>Leader of e-ASIA project in Thailand</td>
</tr>
<tr>
<td>Kanokporn Triwitayakorn</td>
<td>Associate Professor</td>
<td>Institute of Molecular Biosciences, Mahidol University</td>
<td>Cassava marker breeding</td>
</tr>
<tr>
<td>Punchapat Sojikul</td>
<td>Assistant Professor</td>
<td>Faculty of Science, Mahidol University</td>
<td>Transcriptome analysis</td>
</tr>
<tr>
<td>Supajit Sraphet</td>
<td>Research Scientist</td>
<td>Institute of Molecular Biosciences, Mahidol University</td>
<td>Cassava marker breeding</td>
</tr>
<tr>
<td>Sukhuman Whankeaw</td>
<td>Research Scientist</td>
<td>Institute of Molecular Biosciences, Mahidol University</td>
<td>Cassava marker breeding</td>
</tr>
<tr>
<td>Treenut Saithong</td>
<td>Lecturer</td>
<td>King Mongkut University of Technology at Thonburi</td>
<td>Transcriptome analysis</td>
</tr>
</tbody>
</table>

Total number of participants including students: 10
4. Summary of the joint research (up to 4 pages for section 4. to 6. including figures. Please note that information described in this report should only be disclosable.)

Cassava (*Manihot esculenta*) is an important tropical crop for food security, income generation and industrial application in many Asian countries (Fig. 1). We have applied cutting-edge technologies, including functional genomics platform, such as cassava full-length cDNAs and a cDNA microarray containing more than 30,000 genes and heavy-ion mutagenesis, and transformation technology that Japanese groups have developed, to useful cassava plant materials from Thailand and Vietnam for advancing cassava molecular breeding (Utsumi et al. 2015, Proc. 9th Regional Workshop).

We have applied the cassava microarray analysis system to elucidate the molecular mechanisms of various biological phenomenon in cassava, such as tuberization process and disease resistance. Our microarray analysis revealed several useful cassava candidate genes (Sojikul et al., 2015, Plant Mol. Biol.; Utsumi et al. 2016, J. Plant Res.; Utsumi et al. in prep.).

We have optimized the system for induction of friable embryogenic calli in model cassava (Utsumi et al., in prep.). Using the improved transformation protocol, we have produced several transgenic cassava plants for improving cassava biomass and disease resistance. We demonstrated that overexpression of fructose-bisphosphate aldolase 3 (*FBA3*) gene increased tuber root yield in cassava by enhancement of phytosynthesis (Takei et al. in prep.). We are planning to ship these transgenic plants to Vietnam for testing in the cassava biosafety screenhouse.

More than 10,000 KU50/KM94 seeds were harvested by AGI group and shipped to RIKEN group. RIKEN group has performed the heavy ion beam irradiation to the seeds, and then shipped to AGI group. The plants were germinated and grown. About 1,000 irradiated plants were grown on the cassava field of AGI and the screening is in progress (Fig. 2).

We have published the data in peer-reviewed international journals and gave several invited talks in the international meetings. And several new papers will be published in the future. Our collaboration provided various opportunities for education of cutting-edge and global plant science to young researchers, and strengthened our cassava research network and contributed to advancement of cassava molecular breeding.
5. Outputs and Anticipated Outcomes of Joint Research

5-1 Scientific achievements and implemented activities of the joint research

We have applied cutting-edge technologies that Japanese groups have developed, to useful cassava plant materials from Thailand and Vietnam, and obtained the following academic results:

1) Cassava transcriptome analysis using microarray.

We have applied the cassava microarray system to elucidate the molecular mechanisms of disease resistance, such as cassava anthracnose disease (CAD) and tuberous root formation.

CAD caused by the fungus *Colletotrichum gloeosporioides* f. sp. *Manihotis*, is a serious disease of cassava worldwide. Microarray analysis in two cassava cultivars, Huay Bong 60 (HB60, resistant to CAD) and Hanatee (HN, sensitive to CAD) showed that the expressions of various plant defense-related genes, such as pathogenesis-related (PR) genes, cell wall-related genes, detoxification enzyme, genes related to the response to bacterium and mitogen-activated protein kinase (MAPK) were higher in HB60 compared with HN (Fig. 3). Our results indicated that the induction of PR genes in HB60 by fungal infection and the higher expressions of defense response-related genes in HB60 compared with HN are likely responsible for the fungal resistance in HB60.

Microarray analysis during tuberous root formation revealed that dynamic transcriptome changes occur during transition from fibrous roots to tuberous roots and indicated that phytohormones act in concert to regulate the onset of cassava storage root development (Sojikul et al. 2015, Plant Mol. Biol., Utsumi et al. in prep.).

2) Cassava Transformation.

We have optimized the system for induction of FEC in model cassava, TMS60444 (Fig. 4; Utsumi et al., in prep.). Using the improved transformation protocol, we have produced several transgenic cassava plants, such as overexpressor of FBA3 for improving the photosynthesis and cassava biomass, and overexpressor of a disease resistance candidate gene set, *RRS1-RPS4* genes from *Arabidopsis* that function as a Dual Resistance gene system against the *Colletotrichum* fungal
pathogen (Collaboration with Dr. Narusaka, RIBS OKAYAMA and Dr. Shirasu, RIKEN CSRS). In this project, we showed that overexpression of FBA3 gene increased tuber root yield in cassava (Takei et al. in prep.). We are planning to ship these transgenic plants to Vietnam for testing in the cassava biosafety screenhouse. Analysis of other transgenic cassava plants is in progress. We also tried to develop the system for reproducible induction of the FEC and transformation system in Vietnamese varieties. The screening is in progress.

3) Heavy-ion beam mutagenesis

More than 10,000 KU50/KM94 seeds were harvested by AGI group and shipped to RIKEN group. RIKEN group has performed the heavy ion beam irradiation to the seeds, which were then shipped to AGI group. AGI group has performed the embryo rescue of the seeds and then the plants were germinated and grown in the growth room of AGI. About 1,000 irradiated plants were grown on the cassava field of AGI and the phenotype screening is on going (Fig. 5). Several putative candidate lines with valuable traits have been identified, such as early flowering, high yield and no branching.

5-2 Synergistic effects of the international joint research

We could achieve research objectives of this e-ASIA project by utilizing the expertise and research environment. We have trained Vietnamese and Thai young researchers cutting-edge technologies and could strengthen Asian cassava research network (Fig. 6). The information and research resources that have been obtained from the e-ASIA project would contribute to industrial application and sustainability of human life in East Asia. Many cassava researchers had much interests in our invited talks (in International Meetings) that present our cassava collaborative research results.

5-3 Broader impacts including contribution to society

We have advanced Asian cassava molecular breeding by utilizing cutting-edge technologies (Japan), knowledge and breeding technologies in
cassava (Thailand) and cassava breeding technology. AGI and International Center for Tropical Agriculture (CIAT) have established the International Laboratory for Cassava Molecular Breeding (ILCMB) at AGI in 2012. RIKEN group has joined ILCMB since 2012 as a core member. AGI, CIAT and RIKEN groups have advanced Asian cassava molecular breeding. Vietnamese government has great interests in advancement of cassava collaboration between AGI and RIKEN. On May 22, 2013, Vietnamese Deputy Prime Minister (Dr. Nguyen Thien Nhan) visited RIKEN Yokohama Campus to attend a signing ceremony for a memorandum of agreement on cassava research collaboration between AGI and RIKEN CSRS (Please see Annex page 14-15: http://www.riken.jp/en/pr/topics/2013/20130523_2/). By following this event, on June 19, AGI researchers including Dr. Le Huy Ham, Director General and Dr. Kenji Oeda, RIKEN Executive Director have attended the Celebration Meeting on the 40th Anniversary of Vietnam-Japan Diplomatic Relations, Scientific and Technological Cooperation in Hanoi as invited guests (Please see Annex page 16-17). These events clearly indicate great interest in cassava development at governmental and institutional level.

5-4 Development and sustainability of the cooperation
New JST/JICA Cassava SATREPS Project (Research Title: Development and Dissemination of Sustainable Production System based on Invasive Pest Management of Cassava in Vietnam, Cambodia and Thailand; PI: Keiji Takasu, Kyushu Univ.) was launched in Apr. of 2016 towards technology transfer from basic science to applied science. Further continuous and/or new international cassava collaboration with research institutes and universities of Asian countries including other ones, such as China, Indonesia and India etc. will be expected for contribution to food and energy security and industrial development in the future.

6. Recommendations and Comments to the Program
Thank you very much for kind and great support to our cassava collaboration. As you know, cassava is an important tropical crop in many Asian countries, providing food security, income generation for small-scale farmers, and a source of starch for industrial processing. It takes very long time to advance cassava molecular breeding and establish green innovation using cassava, because its generation time is about 1 year and only a few seeds are obtained, resulting in difficulty of genetic analysis and molecular breeding in short period. We would appreciate it very much if you could consider the continuous support for our cassava collaborative research. It will also provide more opportunities for education of cutting-edge plant science to young Asian researchers and strengthen the research network among young researchers.
Annex: List of Scientific Achievements and Implemented Activities of the Joint Research

1 Original Publications (All Authors' Names, Title, Journal Name, Volume, Page, Year, DOI):

1.1 Co-authored among research teams:


1.2 Published by single team:


2 Presentations at conferences (Speaker, Title, Conference Name, Location, Date, Type of Presentation, etc.):

2.1 Co-authored among research teams:
8. Yoshinori Utsumi, Tetsuya Sakurai, Chikako Utsumi, Yoshio Takei, Tomoko Abe,


2.2 Published by single team :


7. Ham Huy Le, “Overview of the Vietnamese activity in e-ASIA cassava project”, The


22. Yoshinori Utsumi, “Molecular Breeding of Useful Cassava using Cutting-edge...
3 Organization of workshops, seminars, symposia, etc. (Organizer, Title of Event, Date, Location, Number of Participants, etc.):

1. Motoaki Seki (an International Organizing Committee Member), The International Congress "World Congress on Root & Tuber Crops - WCRTC", Jan. 18 to 22, 2016, Nanning, China, About 700 participants.
7. RIKEN, International Symposium to advance cassava collaboration between RIKEN CSRS and AGI, May 22, 2013, Yokohama, 50 participants.

4 Researcher exchanges including students (Description of Exchange, Destination, Duration, etc.):

Visits by the Japanese Side to Partner Institutions:

1. Motoaki Seki (Jan. 7 to 10, 2013), AGI (Hanoi), International Symposium and Discussion about collaboration.
2. Yoshinori Utsumi (Jan. 7 to 13, 2013), AGI (Hanoi), International Symposium and Discussion about collaboration.
3. Tomonari Hirano (Jan. 7 to 10, 2013), AGI (Hanoi), International Symposium and Discussion about collaboration.
4. Yoshinori Utsumi (Jul. 29 to Aug. 2, 2013), AGI (Hanoi), Discussion about collaboration.
5. Motoaki Seki (Sep. 9 to 15, 2013), AGI (Hanoi), Hung Loc Agricultural Research Center (Ho Chi Minh), Mahidol Univ. (Bangkok), Discussion about collaboration and survey at cassava field.
6. Yoshinori Utsumi (Sep. 9 to 15, 2013), AGI (Hanoi), Hung Long Agricultural Research Center (Ho Chi Minh), Mahidol Univ. (Bangkok), Discussion about collaboration and survey at cassava field.
7. Yoshinori Utsumi (Dec. 15 to 18, 2013), Hung Long Agricultural Research Center (Ho Chi Minh), Survey at cassava field.
8. Yoshinori Utsumi (May 12 to 17, 2014), AGI (Hanoi), Discussion about collaboration.
9. Yoshinori Utsumi (Jul. 13 to 19, 2014), AGI (Hanoi), Discussion about collaboration.
10. Motoaki Seki (Sep. 14 to 20, 2014), AGI (Hanoi), Mahidol Univ. (Bangkok), Discussion about collaboration.
11. Yoshinori Utsumi (Sep. 14 to 20, 2014), AGI (Hanoi), Mahidol Univ. (Bangkok), Discussion about collaboration.
12. Motoaki Seki (Dec. 7 to 13, 2014), AGI and VAAS Sericulture Center (Hanoi), Hung Loc Agricultural Research Center and AJINOMOTO VIETNAM CO., LTD (Ho Chi Minh), International Symposium, Discussion about (future) collaboration.
13. Yoshinori Utsumi (Dec. 7 to 13, 2014), AGI and VAAS Sericulture Center (Hanoi), Hung Loc Agricultural Research Center and AJINOMOTO VIETNAM CO., LTD (Ho Chi Minh), International Symposium, Discussion about (future) collaboration.
14. Yoshio Takei (Dec. 7 to 13, 2014), AGI and VAAS Sericulture Center (Hanoi), Hung Loc Agricultural Research Center and AJINOMOTO VIETNAM CO., LTD (Ho Chi Minh), International Symposium, Discussion about (future) collaboration.
15. Motoaki Seki (May 24 to 27, 2015), AGI (Hanoi), Discussion about collaboration.
16. Yoshinori Utsumi (May 24 to 27, 2015), AGI (Hanoi), Discussion about collaboration.
17. Motoaki Seki (Oct. 11 to 13, 2015), International Workshop, Thailand Science Park (Bangkok), Discussion about collaboration.
18. Yoshinori Utsumi (Oct. 11 to 13, 2015), International Workshop, Thailand Science Park (Bangkok), Discussion about collaboration.
19. Motoaki Seki (Jan. 17 to 23, 2016), Nanning (China), International Congress and Discussion about collaboration.
20. Yoshinori Utsumi (Jan. 17 to 23, 2016), Nanning (China), International Congress and Discussion about collaboration.
21. Yoshio Takei (Jan. 17 to 23, 2016), Nanning (China), International Congress and Discussion about collaboration.

**Visits by the Partner Research Team to Japan:**

1. Ham Huy Le (AGI) (May 20 to 23, 2013), RIKEN Yokohama (Japan), International Symposium to advance cassava collaboration between RIKEN CSRS and AGI, and Discussion about collaboration
2. Treenut Saithong (King Mongkut’s Univ. of Technology Thonburi) (Oct., 2013), RIKEN Yokohama (Japan), Seminar and discussion about collaboration.
3. Saowalak Kalapanulak (King Mongkut’s Univ. of Technology Thonburi) (Oct., 2013), RIKEN Yokohama (Japan), Seminar and discussion about collaboration.
4. Hoat Xuan Trinh (Plant Protection Research Institute) (Nov., 2013), Univ. of Tokyo, Discussion about collaboration.
5. Thu Anh Vu (AGI) (Oct. 5 to Nov. 7, 2014), RIKEN Yokohama (Japan), Education of cassava tissue culture and transformation.
6. Huong Thi Tong (AGI) (Sep. 5 to 30, 2015), RIKEN Yokohama (Japan), Education of cassava tissue culture, transformation and molecular biology.

5 **Number of patent applications**: 0

6 **Awards**:

1. Motoaki Seki and Yoshinori Utsumi, The 54th SRT (Starch Round Table) Prize, Jun. 6, 2014.

7 **Others (Including agenda of workshop, photos of research teams, meetings, and**
etc.)


2. International Symposium to advance cassava collaboration between RIKEN CSRS and AGI, May 22, 2013, Yokohama

2013 RIKEN VISIT (Yokohama Branch)

by

Dr. Nguyen Thien Nhan, Deputy Prime Minister, Vietnam

Visitors: Dr. Nguyen Thien Nhan, Deputy Prime Minister
Mr. Nguyen Khac Dinh, Deputy Chief, Cabinet Office
Ms. Nguyen Phuoc Ngoc, Deputy Minister, MOFA (Ministry of Foreign Affairs)
Mr. Tran Quang Quy, Deputy Minister, MOET (Ministry of Education & Training)
Mr. Tran Viet Thanh, Deputy Minister, MOST (Ministry of Science and Technology)
Mr. Nguyen Ngoc Phi, Deputy Minister, MOLISA (Ministry of Labor, War Invalids and Social Affairs)
Mr. Nguyen The Phuong, Deputy Minister, MPI (Ministry of Planning and Investment)

Mr. Doan Xuan Hung, Ambassador of Vietnam to Japan

Ms. Le Thi Viet Lam, Deputy Chief, Department of International Cooperation, MOST

Dr. Le Huy Ham, Director General, AGI (Agricultural Genetics Institute)

May 22, Wednesday

15:30-15:40 Welcome speech (Dr. Kenji Oeda, Executive Director, RIKEN)
Dr. Kenji Oeda, Executive Director, RIKEN
Dr. Kazuo Shinozaki, Director of RIKEN Center for Sustainable Resource Science (CSRS)
Mr. Takao Kato, Director of Yokohama Branch
Mr. Toshinari Anzo, Director of Sustainable Resource Science Planning Office
Mr. Soh Osuka, Manager, Global Relations and Research Coordination Office (GRRCO)
Dr. Motoaki Seki, Team Leader of RIKEN CSRS
Dr. Lam-Son Phan Tran, Unit Leader of RIKEN CSRS
Venue: Main Lecture Hall, 1F Main Office Bldg.

15:40-15:45 Speech by Dr. Le huy Ham, Director General, AGI

15:45-15:50 Overview of RIKEN CSRS (Dr. Kazuo Shinozaki, Director, CSRS)

15:50-16:00 International Cassava Collaborative Research between RIKEN and AGI (Dr. Motoaki Seki, Team Leader, RIKEN CSRS)

16:00-16:20 Signing Ceremony
Dr. Le huy Ham, Director General, AGI
Dr. Kazuo Shinozaki, Director, RIKEN CSRS

16:00-16:05 Signing

16:05-16:10 Remarks by Dr. Nguyen Thien Nhan, Deputy Prime Minister

Fig. 8. MOU signing ceremony for cassava collaboration between RIKEN CSRS and AGI (May 22, 2013).
Signer: Dr. Shinozaki (CSRS Director) and Dr. Ham (AGI Director)
### CELEBRATION MEETING

**40th ANNIVERSARY OF VIETNAM-JAPAN S&T COOPERATION**  
June 19th, 2013, Hanoi

**Vietnam-Japan S&T cooperation-Achivements and Prospects**

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<td>08:00-08:30</td>
<td>Registration</td>
<td>ICD</td>
</tr>
<tr>
<td>08:30-08:35</td>
<td>Introduction of program, invitees and participants</td>
<td>ICD</td>
</tr>
<tr>
<td>08:35-08:45</td>
<td>Opening speech</td>
<td>H.E. Mr. Nguyen Quan, Minister of MOST</td>
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<tr>
<td>08:45-08:55</td>
<td>Welcoming speech</td>
<td>Representative from Japan Embassy</td>
</tr>
<tr>
<td>08:55-09:05</td>
<td>Greetings</td>
<td>Mr. Yukio Hatoyama – Former Prime Minister of Japan</td>
</tr>
<tr>
<td>09:05-09:25</td>
<td>Review of Vietnam-Japan S&amp;T cooperation and development orientation.</td>
<td>MOST-ICD</td>
</tr>
<tr>
<td>09:25-09:45</td>
<td>Japan’s comprehensive S&amp;T strategy in its socio-economic development process and its implication for Vietnam</td>
<td>Prof. Yakushiji Taizo, GRIPS, Japan</td>
</tr>
<tr>
<td>09:45-10:00</td>
<td>Tea-break Poster and Exhibition</td>
<td>ICD Presenters</td>
</tr>
</tbody>
</table>
| 10:00-10:45 | Typical cooperation projects                                              | - Dr. Le Huy Ham, Agriculture Genetics Institute, Vietnam;  
|            |                                                                          | - Prof. Hiroshi Ichimura, Kanazawa University, Japan;  
|            |                                                                          | - Mr. Norio Owada, President of ABI Co. Ltd, Japan.    |
| 10:45-11:00 | Signing ceremony                                                          | - Haiphong Medical University (VN) & Kanazawa University (JP)  
|            |                                                                          | - Institute of Regional Research and Development (VN) and ABI Co.Ltd. (JP)  |
| 11:00-13:00 | Courtesy buffet                                                           | MOST-ICD                                     |
Time table:

09:00-09:05 am  Opening address: Dr. Hiroo Fukuda (The University of Tokyo)
09:05-09:25 am  Congratulations speeches:
                 Dr. Trung Khac Quang (President, VAAS)
                 Mr. Atsuki Tomoyose (Second Secretary, Embassy of Japan in Vietnam)
09:25-09:55 am  Dr. Hiroo Fukuda (The University of Tokyo)
                 “Results and Perspectives of NC-CARP (Network of Centers of Carbon
                 Dioxide Resource Studies in Plants) program”
09:55-10:25 am  Dr. Le Huy Ham (AGI)
                 “Development of biotechnology for sustainable food security in Vietnam”
10:25-10:40 am  Group photo, Break
10:40-11:10 am  Dr. Motoaki Seki and Dr. Yoshinori Utsumi (RIKEN)
                 “Advancement of Asian Cassava Molecular Breeding by Cutting-edge
                 Technologies”
11:10-11:40 am  Dr. Hoang Kim (Nong Lam University)
                 “Cassava in Vietnam: save and grow
                 Recent progress of sustainable cultivation techniques for cassava in Vietnam”
11:45-12:00 pm  General discussion for the collaboration between Japan and Vietnam over
                 lunch
01:00-01:30 pm  Dr. Toru Fujiwara (The University of Tokyo)
                 “Strategies to reduce fertilizer usage without loss of yields for sustainable
                 agriculture”
01:30-02:00 pm  Dr. Pham Van Cu (Vietnam National University)
                 “Contribution of remote sensing to sustainable land use in the context of
                 climate change”
02:00-02:30 pm  Dr. Hiroshi Ezura (University of Tsukuba)
                 “Current state of genetic engineering technologies for soft-biomass plants”
02:30-02:45 pm  Break
02:45-03:15 pm  Dr. Akitiho Kondo (Kobe University)
                 “Assessment of biomass property and its application to biorefinery”
03:15-03:45 pm  Dr. Pham Van Cuong (Vietnam National University of Agriculture)
                 “Enhancing cooperation in Research, Training and Universities Management
                 between Vietnam National University of Agriculture and Japanese
                 Universities”
03:45 pm -  Closing remarks: Dr. Le Huy Ham (AGI)

Fig. 13. International Symposium "Collaboration between Japan and Vietnam for the sustainable future-Plant science,
agriculture and biorefinery." (Dec. 8, 2014, AGI, Hanoi)

5. The e-ASIA Joint Research Program (e-ASIA JRP) Project Workshop, Oct. 12,
2015, Thailand Science Park, Thailand

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08.30-09.00</td>
<td>Registration</td>
</tr>
<tr>
<td>09.00-12.00</td>
<td>Cassava Project Final Report Session</td>
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<tr>
<td>Time</td>
<td>Session</td>
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<td>------------</td>
<td>--------------------------------------------------------------------------</td>
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<tr>
<td>09.00-09.15</td>
<td>Welcome and Overview of Cassava R&amp;D Support Activities in Thailand</td>
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<tr>
<td></td>
<td>Prof. Dr. Morakot Tanticharoen, Senior Advisor to the President,</td>
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<td></td>
<td>National Science and Technology Development Agency (NSTDA)</td>
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<tr>
<td>09.15-09.25</td>
<td>Overview of the e-ASIA cassava project 2012-2015</td>
</tr>
<tr>
<td></td>
<td>Dr. Motoaki Seki, RIKEN, Japan</td>
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<tr>
<td>09.25-09.45</td>
<td>Japanese approaches towards molecular breeding of cassava in</td>
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<td></td>
<td>collaboration with Thailand and Vietnam</td>
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<tr>
<td></td>
<td>Dr. Yoshinori Utsumi, RIKEN, Japan</td>
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<tr>
<td>09.45-09.55</td>
<td>Overview of the Vietnamese activity in e-ASIA cassava project</td>
</tr>
<tr>
<td></td>
<td>Dr. Ham Huy Le, Agricultural Genetics Institute (AGI), Vietnam</td>
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<tr>
<td>09.55-10.15</td>
<td>Development of new cassava varieties via mutation breeding and</td>
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<tr>
<td></td>
<td>genetic engineering</td>
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<td></td>
<td>Dr. Vu Anh Nguyen, Agricultural Genetics Institute (AGI), Vietnam</td>
</tr>
<tr>
<td>10.15-10.25</td>
<td>Overview of the Thai activity in e-ASIA cassava project</td>
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<tr>
<td></td>
<td>Dr. Jarunya Narangajavan, Mahidol University, Thailand</td>
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<tr>
<td>10.25-10.45</td>
<td>Molecular breeding for improving disease-resistant cassava</td>
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<td>Dr. Kanokporn Triwittayakorn, Mahidol University, Thailand</td>
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<tr>
<td>10.45-10.55</td>
<td>Discussion on e-ASIA project</td>
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<tr>
<td>10.55-11.10</td>
<td>Coffee Break</td>
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<tr>
<td>11.10-11.20</td>
<td>Single Nucleotide Polymorphism Genotyping by Sequencing</td>
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<td></td>
<td>Dr. Sithiche Tantphatsornruang, National Science and Technology</td>
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<td>Development Agency (NSTDA), Thailand</td>
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<td>11.20-11.30</td>
<td>Genome-wide analysis: unraveling the puzzle of phytohormones acting in</td>
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<td>concert during storage root initiation of cassava</td>
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<td>Dr. Punchapat Sojikul, Mahidol University, Thailand</td>
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<tr>
<td>11.30-11.40</td>
<td>Linking genotype to phenotype through cassava modeling</td>
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<td>Dr. Treenut Saithong, King Mongkut’s University of Technology</td>
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<td>Thonburi (KMUTT), Thailand</td>
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<tr>
<td>11.40-11.50</td>
<td>Cassava Breeding in Thailand for Food Products</td>
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<td>Dr. Pasajee Kongsil, Kasetsart University, Thailand</td>
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<td>11.50-12.00</td>
<td>Discussion on new collaboration</td>
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<td>12.00-12.10</td>
<td>Closing Remarks of Morning Session</td>
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<td>Dr. Motoaki Seki, RIKEN</td>
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Fig. 14. The e-ASIA Joint Research Program (e-ASIA JRP) Project Workshop  
(Oct. 12, 2015, Thailand Science Park, Thailand)

6. CREST International Symposium  “Towards Increased Plant Productivity through  
Understanding of Enviromental Responses and Epigenetic Regulation", Nov. 24
Tuesday, November 24, 2015

Welcome and introduction to the symposium: Motoaki Seki (RIKEN CSRS)

Opening remark: Dr. Kazuo Shinozaki (Director, RIKEN CSRS)

Session 1: Plant epigenetics (Chair: Motoaki Seki)

9:10-9:40
Title: Protein interactions in histone deacetylase complexes.
Anna Amtmann (University of Glasgow /UK)

9:40-10:10
Title: Novel epigenetic control of drought tolerance in plants
Jong-Myong Kim (RIKEN CSRS, Japan)

10:40-10:10 Coffee break

10:30-11:00
Title: Epigenetic memory configures siRNA biogenesis and ecotype hybrid incompatibility in Arabidopsis.
Todd Blevins (CNRS, France)

11:00-11:30
Title: Epigenetic regulation of gene expression by histone deacetylases in plants
Keqiang Wu (National Taiwan University, Taiwan)

11:30-13:00: Lunch

Session 2: Plant vegetative reproduction (Chair: Moto Ashikari)

13:00-13:30
Title: The secrets of an underground life - Development of Olyza longistaminata rhizome
Junko Kyozuka (Tohoku University, Japan)

13:30-13:50
Title: Physiological Analyses of the development of rhizome of Oryza longistaminata, a wild rice species from Africa
Kanako Uehara (Nagoya University, Japan)

13:50-14:10
Title: Exploring rhizome formation loci in Rice
Tomoyuki Furuta (Nagoya University, Japan)

14:10-14:30 Coffee break

14:30-15:00
Title: An ancient regulatory mechanism for secondary meristem formation in land plants
Kimitsune Ishizaki (Kobe University, Japan)

15:00-15:30
Title: Florigen function beyond flowering: florigen Hd3a protein acts as a mobile branching signal in rice
Hiroyuki Tsuji (Yokohama City University, Japan)

15:30-16:00
Title: Day length pathway for potato storage organ formation.
Salome Prat (CNB /Spain)

16:00-16:20 Coffee break

16:20-17:50 Poster session

18:00-20:00 Party (RIKEN Cafeteria)

Wednesday, November 25, 2015

Session 3: Tuber root productivity (Chair: Motoaki Seki)
9:00-9:30
Title: MicroRNAs and their regulatory roles in Euphorbia plants: Learning from rubber tree and cassava.
Jarunya Narangajavana (Mahidol University, Thailand)

9:30-10:00
Title: Towards cassava molecular breeding of improved biomass productivity and quality in collaboration with ASEAN countries.
Yoshinori Utsumi (RIKEN CSRS, Japan)

10:00-10:30
Title: Back to the roots: molecular characterization of cassava root responses during drought and post-harvest stresses
Herve Vanderschuren (ETH, Switzerland)

10:30-10:50 Coffee break

10:50-11:20
Title: Storage root development and regulation in root crops.
Peng Zhang (Shanghai Inst. Biol. Sci., China)

11:20-11:50
Title: Genetic engineering in sweet potato for the improvement of productivity and stress tolerance.
Noriaki Tanabe (Kinki University, Japan)

11:50-11:55
Closing remark: Moto Ashikari (Nagoya Univ.)

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Fig. 15. International Symposium (Nov. 24 and 25, 2015)