

# Program of the 10th annual meeting

## of Japanese Society of Plant-Microbe Interactions

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[Special presentation](#)

[Oral presentation](#)

[Poster presentation](#)

[Schedule](#)

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### Special presentation

**1. The influence of inoculum dosage and other physiological factors on host-controlled restriction of nodulation in the *Bradyrhizobium japonicum* / soybean symbiosis**

Professor Michael J. Sadowsky  
University of Minnesota

**2. Coordination of plant and bacterial gene expression during the early stages of soybean nodulation by *Bradyrhizobium japonicum*.**

Professor Gary Stacey  
University of Tennessee

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### Oral presentation

**1. Genome analysis of *Mesorhizobium loti***

\*T. KANEKO, Y. NAKAMURA, S. SASAMOTO, A. WATANABE, T. KIMURA, M. YAMADA, K. IDESAWA, K. KAWASHIMA, Y. KISHIDA, C. KIYOKAWA, S. SHINPO, C. TAKEUCHI, N. NAKAZAKI, S. NAKAYAMA, A. MATSUNO, M. MATSUMOTO and S. TABATA  
Kazusa DNA Res. Inst.

**2. Abilities of flavonoids to affect nod gene expression in Thai soybean *Bradyrhizobium* with reference to USDA strains of *B. japonicum* and *B. elkanii*.**

\*Tadashi YOKOYAMA<sup>1</sup>, Shotaro ANDO<sup>2</sup> and Hisatoshi KAKU<sup>3</sup>  
1 Tokyo University of Agriculture and technology  
2 Japan International Research Center for Agricultural Sciences  
3 National Institute of Agrobiological Resources

**3. Symbiotic characterization of root nodule bacteria isolated from *Acacia* sp.**

\*A. NGOM<sup>1</sup>, M. Abe<sup>2</sup>, T. UCHIUMI<sup>2</sup>, S. SUZUKI<sup>2</sup> and S. HIGASHI<sup>2</sup>  
1 Grad. School of Sci. & Eng. Kagoshima Univ., 2 Dept. Chem. & BioSci. Kagoshima Univ.

**4. Genetic analysis of *Mesorhizobium loti* Exo and Fix mutant strain**

\*Kazuhiko Saeki<sup>1</sup>, Chie Mito<sup>1</sup>, Hirofumi Omori<sup>1</sup>, Haruko Imaizumi-Anraku<sup>2</sup>, Masayoshi Kawaguchi<sup>2</sup>, Takakazu Kaneko<sup>3</sup> and Satoshi Tabata<sup>3</sup>  
1 Dept. Biol., Grad. Sch. Sci., Osaka Univ., 2 Grad. Sch. Art & Sci., Univ. Tokyo,  
3 Kazusa DNA Inst.

**5. Nitrogen regulation of gene expression in Lotus root hairs**

\*Takaki Maekawa, Makoto Hyashi and Yoshikatu Murooka  
Department of Biotechnology, Graduate School of Engineering, Osaka University

**6. Suspension culture of *Sesbania rostra* and its reactions to Nod factor**

\*Norihiro Kanamori, Satoshi Shibata, Hiroki Miwa and Hiroshi Oyaizu

**7. Signal transduction cascades in response to Nod factors in Lotus**

\*Naoya Takeda, Makoto Hayashi and Yoshikatsu Murooka

Department of Biotechnology, Graduate School of Engineering, Osaka University

**8. Effect of cAMP and cGMP on nodule formation**

\*Junko Terakado and Tadakatsu Yoneyama

University of Tsukuba, University of Tokyo

**9. Preference mechanisms of Rj gene in soybean for nodulation by**

***Bradyrhizobium japonicum***

\*Takeo Yamakawa, Masayuki Tanaka, Akino Miyata and Motoki Ikeda

Division of Bioresource and Environmental Sciences, Graduate School, Kyushu University

**10. Differential regulation of CHS genes by rhizobia and pathogens**

\*Mitsunori Sakata, Makoto Hayashi and Yoshikatsu Murooka

Department of Biotechnology, Graduate School of Engineering, Osaka University.

**11. Expression analysis of uricase mRNA in Lotus japonicus**

\*K. Takane<sup>1</sup>, S. Tajima<sup>2</sup> and H. Kouchi<sup>1</sup>

<sup>1</sup>Department of Plant Physiology, National Institute of Agrobiological Resources

<sup>2</sup>Department of Life Science, Kagawa University

**12. Expression of two distinct dynamin members in Lotus**

\*Kouji Yano, Makoto Hayashi and Yoshikatsu Murooka

Department of Biotechnology, Graduate School of Engineering, Osaka University

**13. Molecular characterization of phosphoenolpyruvate carboxylase and its protein kinase in Lotus japonicus root nodules**

\*Shingo Hata<sup>1,2</sup>, Tomoko Izumi<sup>1</sup>, Tomomi Nakagawa<sup>2</sup>, Katsura Izui<sup>1,2</sup>, Yosuke Umehara<sup>3</sup>, and Hiroshi Kouchi<sup>3</sup>

<sup>1</sup>Graduate School of Biostudies, Kyoto University, <sup>2</sup>Graduate School of Agriculture, Kyoto University, <sup>3</sup>National Institute of Agrobiological Resources

Kyoto University, <sup>3</sup>National Institute of Agrobiological Resources

**14. Characterization of arbuscules formed on the roots of hypernodulating mutants of Lotus japonicus**

\*Keishi Senoo<sup>1</sup>, M. Zakaria Solaiman<sup>1</sup>, Masayoshi Kawaguchi<sup>2</sup>, Haruko Imaizumi-Anraku<sup>3</sup>, Shoichiro Akao<sup>3</sup>, Akiyoshi Tanaka<sup>1</sup> and Hitoshi Obata<sup>1</sup>

<sup>1</sup>Fac. of Bioresources, Mie Univ., <sup>2</sup>Arts and Science, The Univ. of Tokyo,

<sup>3</sup>National Institute of Agrobiological Resources

**15. Nodulin genes whose expression are reduced in ineffective nodules induced on the pea mutant E135 (sym13)**

\*Takashi Katō<sup>1</sup>, Norio Suga<sup>1</sup>, Kazuya Kawashima<sup>1</sup>, Masami Miwa<sup>1</sup>,

Yoshifumi Mimura<sup>1</sup>, Masanori Tamaoki<sup>1</sup> and Hiroshi Kouchi<sup>2</sup>

<sup>1</sup>Aichi University of Education, <sup>2</sup>National Institute of Agrobiological Resources

**16. Involvement of photosynthate supply on nitrate inhibition of soybean nodule growth and N<sub>2</sub> fixation.**

\*Hiroyuki Fujikake<sup>1</sup>, Taketo Suga<sup>1</sup>, Youhei Tamura, Norikuni Ohtake<sup>1</sup>, Kuni Sueyoshi,

Takuji Ohyama<sup>1</sup>, Noriko Ishioka<sup>2</sup>, Satoshi Watanabe<sup>2</sup>, Akihiko Osa<sup>2</sup>, Mitsuo Koizumi<sup>2</sup>,

Toshiaki Sekine<sup>2</sup>, Shinpei Matsushita<sup>3</sup>, Takehito Ito<sup>3</sup>, Chizuko Mizuniwa<sup>3</sup>, Tamikazu Kume<sup>3</sup>,

Hiroshi Uchida<sup>4</sup> and Atsunori Tsuji<sup>4</sup>

<sup>1</sup>Faculty of Agriculture, Niigata University, <sup>2</sup>Department of Radioisotopes, JAERI

<sup>3</sup>Biofunction Laboratory, Department of Radiation Research, JAERI

<sup>4</sup>Central Research Laboratory, Hamamatsu Photonics Co.

**17. Generation of transgenic Arabidopsis with modified amino acid contents using seed specific promoter from soybean**

\*Yukiko Mori, Makoto Hayashi and Yoshikatsu Murooka

Department of Biotechnology, Graduate School of Engineering, Osaka University

**18. Effect of nitrogen and phosphate supply on the accumulation of seed storage protein in nitrogen deficient soybean plants.**

\*Ohtake Norikuni, Sayuri Okano, Hiroyuki Fujikake, Tahei Kawachi, Kuni Sueyoshi

and Takuji Ohyama

**19. Polyphosphate metabolism in arbuscular mycorrhizal fungi: properties of hydrolytic enzyme and vacuolar pH as a possible regulatory factor.**

\*T. EZAWA<sup>1</sup>, S.E. SMITH<sup>2</sup> and F.A. SMITH<sup>2</sup>

<sup>1</sup>Graduate school of Bioagriculture, Nagoya Univ.

<sup>2</sup>Centre for Plant Root Symbioses, Univ. of Adelaide, Australia

**20. Pioneer plants and symbiotic microorganisms in acid sulfate soil**

\*T.MAKI, T.EZAWA and S.YOSHIDA

Graduate school of Bioagriculture, Nagoya Univ.

**21. Propagation of the soybean cyst nematode on hairy roots and expression of resistance in transgenic roots**

\*Hyeon-Je Cho <sup>1</sup>, G. R. Noel <sup>2</sup>, S. K. Farrand <sup>1</sup> and J. M. Widholm <sup>1</sup>

<sup>1</sup>Department of Crop Sciences and <sup>2</sup>USDA-ARS, University of Illinois, Urbana, IL 61801, USA

**22. The causal bacterium of red stripe of rice and its infection mode**

\*H. KAKU<sup>1</sup>, S. Subandiyah<sup>2</sup> and H. OCHIAI<sup>1</sup>

<sup>1</sup>Department of Genetic Resources I, National Institute of Agrobiological Resources

<sup>2</sup>Gadjamada University

**23. Transient GUS expression in *Astragalus sinicus* by *Agrobacterium* in planta transformation**

\*Myra L. Tansengco, Makoto Hayashi and Yoshikatsu Murooka

Department of Biotechnology, Graduate School of Engineering, Osaka University

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## Poster presentation

**1. Characterization of nitrogen-fixing endophytic bacteria and behavior of GFP-marked isolates in sugarcane**

Constancio A. Asis, Jr., Masatsugu Kubota, Hiroyuki Ohta, Yasuhiro Arima, Ken-ichi Tsuchiya and \*Shoichiro Akao

National Institute of Agrobiological Resources

**2. Endophytic colonization and nitrogen fixation in rice by *Herbaspirillum* sp. isolated from wild rice**

\*ADEL ELBELTAGY, KIYO NISHIOKA, TADASHI SATO, HISA SUZUKI, KEN-ICHI YUHASHI, BIN YE, HISAYUKI MITSUI and KIWAMU MINAMISAWA

Institute of Genetic Ecology, Tohoku University

**3. Measurement of nitrogen fixation of sugar cane by 15-N dilution method**

\*Atsushi Momose<sup>1</sup>, Takahiro Hiyama<sup>1</sup>, Noriko Ishizaki<sup>1</sup>, Norikuni Ohtake<sup>1</sup>, Kuni Sueyoshi<sup>1</sup>, Takuji Ohyama<sup>1</sup>, Yasuhiro Nakanishi<sup>2</sup> and Syoichiro Akao<sup>3</sup>

<sup>1</sup>Faculty of Agriculture, Niigata University, <sup>2</sup>Tokyo University of Agriculture

<sup>3</sup>National Institute of Agrobiological Resources

**4. Phosphorus transfer and translocation in arbuscular mycorrhizal onion: Estimation based upon hyphal P distribution and P efflux from intraradical hyphae isolated roots.**

\*Masanori SAITO and Zakaria Md. SOLAIMAN

National Grassland Research Institute

**5. Malic enzymes distribution among local microbes from Thailand**

\*Suphawat Sinsuwongwat<sup>1</sup>, Naofumi Hiramitsu<sup>2</sup>, Mika Agarie<sup>2</sup> and Shigeyuki Tajima<sup>2</sup>

<sup>1</sup>Department of Biotechnology, Faculty of Agro-Industry, Chiangmai University, Chiangmai, 50100, THAILAND. <sup>2</sup>Department of Life Science, Faculty of Agriculture,

Kagawa University, 2393 Ikenobe, Miki-cho, Kita-gun, Kagawa, 761-0795, JAPAN

**6. Response of vegetables to inoculation of plant growth promoting bacteria**

\*E. S. GARCIA

BIOTECH, UP Los Banos, Philippines

**7. Studies for Gene Cloning and Expression Analysis of NAD-Malic Enzyme in**

***Bradyrhizobium japonicum* A1017**

\*Naofumi Hiramitsu, Takashi Aoki, Mika Agarie and Shigeyuki Tajima  
Kagawa Univ.

**8. Rhizobitoxine biosynthetic pathway in *Bradyrhizobium elkanii* revealed by disruption of *rtx* genes**

\*Tsuyoshi Yasutal, Hiroshi Ezura<sup>2</sup>, Ken-ichi Yuhashil and Kiwamu Minamisawal  
1Institute of Genetic Ecology, Tohoku University  
2Plant Biotechnology Institute, IBARAKI Agricultural Center

**9. Rhizobitoxine production by *Bradyrhizobium elkanii* enhances nodulation and competitiveness on legume**

\*Shin Okazaki<sup>1</sup>, Hiroshi Ezura<sup>2</sup>, Ken-ichi Yuhashil and Kiwamu Minamisawal  
1Institute of Genetic Ecology, Tohoku University  
2Plant Biotechnology Institute, IBARAKI Agricultural Center

**10. Two rhizobial genes encoding sigma32-like proteins involved in the heat shock response and symbiotic nitrogen fixation**

\*Toshifumi SATO, Hisayuki MITSUI and Kiwamu MINAMISAWA  
(Institute of Genetic Ecology, Tohoku University)

**11. Effect of nutrient starvation of *Rhizobium tropici* CIAT899 on survival in acid soil with high Al<sup>3+</sup> and Mn<sup>2+</sup> content**

\*Choochad Santasup<sup>1</sup>, Keishi Senoo<sup>1</sup>, Ampan Bhromsiri<sup>2</sup>, Arawan Shutsrirung<sup>2</sup>, Akiyoshi Tanaka<sup>1</sup> and Hitoshi Obata<sup>1</sup>  
1Fac. of Bioresources, Mie University, 2 Fac. of Agriculture, Chiang Mai University

**12. Effect of hydroxylysine on the metabolism of poly- $\beta$ -hydroxybutyrate in *Rhizobium leguminosarum* bv. *phaseoli***

\*N. Saito, H. Masuda, Y. Tokuji and T. Ohwada  
Department of Bioresource Science, Obihiro University of Agriculture and Veterinary Medicine

**13. Acid tolerant root nodule bacteria isolated from soybean cultivated in Indonesia**

\*S. FUKUDA<sup>1</sup>, M. ABE<sup>2</sup>, T. UCHIUMI<sup>2</sup>, A. SUZUKI<sup>2</sup> and S. HIGASHI<sup>2</sup>  
1Grad. School of Sci. & Eng. Kagoshima Univ., 2Dept. Chem. & BioSci. Kagoshima Univ.

**14. Synteny analysis by GISH between soybean and Lotus**

\*Yasuaki Katada, Makoto Hayashi, Mikako Ito, Kiichi Fukui and Yoshikatsu Murooka  
Department of Biotechnology, Graduate School of Engineering, Osaka University

**15. Construction of AFLP markers in *Lotus japonicus***

\*Makoto Yo shikawa, Makoto Hayashi and Yoshikatsu Murooka  
Dept.of Biotechnology, Graduate school of Engineering Osaka Univ.

**16. Generating codominant markers for positional cloning of *Lotus japonicus***

\*Makoto Hayashi, Shusei Satol, Satoshi Tabatal, Kyuya Harada<sup>2</sup> and Yoshikatsu Murooka  
Department of Biotechnology, Graduate School of Engineering, Osaka University  
1 Kazusa DNA Research Institute, 2 Faculty of Horticulture, Chiba University

**17. cDNA cloning of *Lotus japonicus* genes for mitochondrial phosphate transporter and squalene synthase**

\*Shingo Hata<sup>1</sup>, Kazuki Nakamoril, Satomi Akamine<sup>1</sup>, Mari Banbal, Katsura Izuil, Yosuke Umehara<sup>2</sup> and Hiroshi Kouchi<sup>2</sup>  
1Graduate School of Biostudies, Kyoto University  
2National Institute of Agrobiological Resources

**18. Structure and expression of globin gene family in *Lotus japonicus***

\*Y. SHIMODA<sup>1</sup>, T. UCHIUMI<sup>2</sup>, T.TSURUTA<sup>1</sup>, Y. MUKOYOSHI<sup>2</sup>, A. SUZUKI<sup>2</sup>, S. HIGASHI<sup>2</sup> and M. ABE<sup>2</sup>  
1Grad. School of Sci. & Eng. Kagoshima Univ., 2Dept. Chem. & BioSci. Kagoshima Univ.

**19. Symbiotic ability of *Rhizobium* that symbiosis with *Lotus japonicus* in Miyakojima**

\*N. MORIHATA<sup>1</sup> M. ABE<sup>2</sup>, T. UCHIUMI<sup>2</sup>, A. SUZUKI<sup>2</sup> and S. HIGASHI<sup>2</sup>  
1Grad. School of Sci. & Eng. Kagoshima Univ., 2Dept. Chem. & BioSci. Kagoshima Univ.

**20. Nitrate inhibition of nitrogenase activity in Lotus root nodules -Nodule nitrate reductase and sucrose synthase-**

\*Kazuhisa Kato, Yoshinori Okamura and Yoshinori Kanayama  
Graduate School of Agricultural Science, Tohoku University

**21. Nodulation of transgenic *Lotus japonicus* with heterologous ethylene receptor gene**

\*Noriyuki Nukuil, Hiroshi Ezura<sup>2</sup>, Ken-ich Yuhashil and Kiwamu Minamisawal  
1Institute of Genetic Ecology, Tohoku University  
2Plant Biotechnology Institute, Ibaraki Agriculture center

**22. Analysis of expression and location of *nod* and *nif* genes introduced to *Agrobacterium***

\*T. FUKUMORI<sup>1</sup>, M. ABE<sup>2</sup>, T. UCHIUMI<sup>2</sup>, A. SUZUKI<sup>2</sup> and S. HIGASHI<sup>2</sup>  
1Grad. School of Sci. & Eng. Kagoshima Univ.  
2Dept. Chem. & BioSci. Kagoshima Univ.

**23. Analysis of *mcp* deleted mutants of *Sinorhizobium meliloti*: their nodulation and nitrogen fixation**

\*Toshiyuki Morishita, Yuki Tsunamoto, Minoru Sugiura, Akira Tabuchi, Paul Muschler<sup>1</sup>, Ruediger Schmitt<sup>1</sup> and Den'ei Karasawa  
SinsyuUniv., <sup>1</sup>Regensburg Univ.

**24. Effect of salicylic acid supply to culture medium on soybean nodulation**

\*T. SATO<sup>1</sup>, T. TAKAHASHI<sup>1</sup>, A. SATO<sup>1</sup> and T. OHYAMA<sup>2</sup>  
1Faculty of Bioresource Sciences, Akita Prefectural University, Akita.  
2Faculty of Agriculture, Niigata University, Niigata.

**25. The comparison of the growth and nitrogen fixation activity of hypernodulation mutant NOD1-3 and its parent cv. Williams in field cultivation**

\*Taketo Suganuma, Hiroyuki Fujikake, Youhei Tamura, Norikuni Ohtake, Kuni Sueyoshi, and Takuji Ohyama  
Faculty of Agriculture, Niigata University

**26. Identification of the type of nitrogenous compounds (including amino acids) relating to the translocation of fixed nitrogen in yam bean, *Pachyrhizus erosus* L. Urban.**

\*J. B. FENTES<sup>1</sup>, M. ABE<sup>2</sup>, N. OHTAKE<sup>3</sup>, H. FUJITAKE<sup>3</sup>, T. OHYAMA<sup>3</sup>,  
T. UCHIUMI<sup>2</sup>, S. SUZUKI<sup>2</sup>, and S. HIGASHI<sup>2</sup>  
1Grad. School of Sci. & Eng. Kagoshima Univ.,  
2Dept. Chem. & BioSci. Kagoshima Univ. 3Dept. Agr. Chem. Niigata Univ.)

**27. Purification and cloning of cDNA of novel elicitor protein from *Phytophthora infestans***

\*N.Hatsugai, A. Hassan, R. Ikeda, T. Matsuura and N. Furuichi  
Graduate School of Science and Technology Niigata University

**28. Calcium dependent protein kinase from potato which can regulate defe reaction in the interaction between potato and *Phytophthora infes***

\*A. Hassan, M. Matsubara, T. Okuta, H. Hara, H. Oika, A. Ichihara, N. Hatsugai, and N. Furuichi  
Graduate school of Science & Technology, Niigata University

**29. Multi-tolerance of *Rhodotorula glutinis* R-1 for Acid, Aluminum and Manganese and application for bioremediation of acid soil**

\*Makoto Hisamatsu, VIET ANH THI NGUYEN  
Bioresources, Mie Univ.

**30. Phosphoinositides and their role in plant defense signal transduction**

\*Kazuhiro Toyoda, Tomoharu Kawahara, Yuki Ichinose, Tetsuji Yamada and Tomonori Shiraishi  
Laboratory of Plant Pathology & Genetic,  
Engineering, Faculty of Agriculture, Okayama University

**31. Structural and Functional Characterization of HR Cell Death Elicitor, Harpin from *Pseudomonas syringae***

\*Andi Salamah, Yuki Ichinose, Rui Tanaka, Fumiko Taguchi, Reina Doi, Kazuhiro Toyoda, Tomonori Shiraishi and Tetsuji Yamada  
Faculty of Agriculture, Okayama University

**32. Tissue- and cell-specific expression of elicitor-responsive genes in rice plants**

\*Shigeru Tanabe, Eiichi Minami and Naoto Shibuya  
National Institute of Agrobiological Resources

**33. Characteristics of infection of *Fusarium oxysporum f. sp. asparagi*  
in asparagus infected with arbuscular mycorrhizal fungus**

\*Yoh-ichi Matsubara, Naoko Ohba and Hirokazu Fukui  
Faculty of Agriculture, Gifu University

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## Schedule

### November 1 (Wednesday)

12:30-13:30 Registration  
13:30-13:45 Greetings of Chair of Society  
13:45-14:30 Oral Presentation 1-3 Chairperson, Dr. Saeki  
14:30-15:00 Oral Presentation 4&5 Chairperson, Dr. Takane  
15:00-15:15 Break  
15:15-15:45 Oral Presentation 6&7 Chairperson, Dr. Terakado  
15:45-16:30 Oral Presentation 8-10 Chairperson, Dr. Sato  
16:30-16:45 Break  
16:45-17:15 Oral Presentation 11&12 Chairperson Prof. Hata  
17:15-17:30 Oral Presentation 13 Chairperson, Dr. Ohtake

### November 2 (Thursday)

9:00-11:00 Poster Presentation (Odd Numbers)  
11:00-12:00 Special Presentation 1 Prof. Michael J. Sadowsky  
(Chairperson, Prof. Minamisawa)  
12:00-13:00 Lunch  
13:30-14:30 Special Presentation 2 Prof. Gary Stacey  
(Chairperson, Prof. Abe)  
14:30-16:30 Poster Presentation (Even Numbers)  
16:30-17:00 General Meeting of members (Chairperson, Prof. Tajima)  
18:00-20:30 Banquet

### November 3 (Friday)

9:00- 9:30 Oral Presentation 14&15 Chairperson, Dr. Hayashi  
9:30-10:15 Oral Presentation 16-18 Chairperson, Dr. Suganuma  
10:15-10:30 Break  
10:30-11:00 Oral Presentation 19&20 Chairperson, Dr. Saito  
11:00-11:45 Oral Presentation 21-23 Chairperson, Prof. Hisamatsu  
11:45-12:30 General Discussion Chairperson, Prof. Emeritus Higashi

Bon Voyage

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