

Masashi Yamada, Ph.D.
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PROFESSIONAL EXPERIENCE

Assistant Research Fellow **2018-Present**
Agricultural Biotechnology Research Center, Academia Sinica, Taiwan
Biotechnology Center in Southern Taiwan, Academia Sinica, Taiwan

- Developing a novel high-throughput method to knockdown alternatively splicing isoforms by a topical application of RNAi without using genetic modification
- Developing and conducting a novel method to detect alternatively spliced isoforms in the specific root tissue in plants induced by abiotic stress
- Conducting transcriptomic and proteomic analysis to understand the mechanism of the post-translational regulation by root meristem growth factor1 (RGF1) peptide

Research Scientist **2015-2018**
Postdoctoral Fellow **2010-2015**

PI: Philip Benfey, Duke University, U.S.A.

- Conducted transcriptomic analyses to detect alternatively spliced isoforms and long intergenic noncoding (linc) RNAs in all cell types and developmental stages of the *Arabidopsis* root
- Demonstrated expression of a substantial number of novel alternatively spliced isoforms and linc RNAs at a cell type and developmental specific level
- Characterized the role of alternatively spliced isoforms of a transcription factor in regulating development of the root
- Conducted whole-genome transcriptional analyses of the effects of root meristem growth factor1 (RGF1) to understand the role of this peptide in root development.
- Demonstrated that RGF1 regulates reactive oxygen species (ROS) signals in the meristematic zone of root
- Demonstrated that RGF1 post-translationally regulates PLETHORA protein via ROS signals
- Characterized a mutant of a novel transcription factor in the meristematic zone through the RGF peptide pathway

Postdoctoral Fellow **2008-2010**
Professor Shinichiro Sawa (Present: University of Kumamoto); PI: Hiroo Fukuda,
University of Tokyo, Japan

- Screened for enhancer mutants of the *clavata2* (*clv2*) mutant
- Developed a new method to identify a causal mutation by low-coverage genome re-sequencing in *Arabidopsis*
- Characterized the G-protein beta subunit (*agb1*) mutant in the shoot meristem through the CLAVATA/ESR (CLE) peptide pathway

Application engineer **1997-2001**

Department of confocal microscopy, Leica Microsystems K.K., Japan,

- Demonstrated the usage and benefit of the conventional and two-photon laser scanning confocal microscope
- Collaborated with some users using our confocal system and published a paper

EDUCATION

Ph.D. in Molecular, Cellular & Developmental Biology **2002-2008**

Thesis Advisor: Mark Estelle (Present: University of California, San Diego), Indiana University, Bloomington, U.S.A.

Dissertation: “The role of the *TRANSPORT INHIBITOR RESPONSE2 (TIR2)* gene in auxin synthesis in *Arabidopsis*”

- Characterization of the *transport inhibitor response2 (tir2)* mutant
- Demonstrated that *TIR2* encodes a novel enzyme for auxin biosynthesis
- Showed that *TIR2* is required for root meristem development
- Demonstrated that *TIR2* is responsive to gravity and high temperature and controls root development

M.S. in Biosystems **1995-1997**

Masters Advisor: Satoru Kobayashi, University of Tsukuba, Japan

Dissertation: “The role of NANOS for germline development in *Drosophila melanogaster*”

- Conducted transplant experiments of primordial germ cells (pgc) of *nanos (nos)* and *pumilio (pum)* mutant embryos to demonstrate function
 - Demonstrated that NOS and PUM are required for translational repression of cyclinB (*cycB*) mRNA through its 3'UTR
 - Showed that pgcs lacking NOS and PUM activities prematurely start cell division and cannot develop into functional germ cells.

B.S. in Biology **1991-1995**

Advisor: Satoru Kobayashi, University of Tsukuba, Japan

Teaching Experience

Teaching Assistant, Molecular Biology (Honors), Indiana University **2005**

I was a teaching assistant for an honors class in Molecular Biology of 15 undergraduate students at Indiana University. In this class, students designed experiments to address biological questions. Before the course started, I met with each student several times to discuss what types of biological questions they were interested in and I helped them to design practical experiments to address these questions.

Statistics and Computing Training

2014 Next Generation Data Analysis Workshop, UC Riverside, U.S.A.

2012 Bioinformatics Training Course, NIBB, Japan

Fellowship

2008 Floyd/Ogg/Cleland Plant & Fungal Biology Final Year Fellowship (Indiana University)

2007 Floyd Plant & Fungal Biology Summer Fellowship (Indiana University)

2006 Floyd Plant & Fungal Biology Summer Fellowship (Indiana University)
2005 Floyd Plant & Fungal Biology Summer Fellowship (Indiana University)
2004 Floyd Plant & Fungal Biology Summer Fellowship (Indiana University)
1995-1997 the Japan Scholarship Society Fellowship (University of Tsukuba)

Journal Reviewer

PNAS
Plant Physiology
EMBO report
Frontiers in Plant Science
Non-coding RNA
Molecular Plant

Research Papers

Google Scholar Citations: <https://scholar.google.com/citations?user=BOreRvIAAAAJ>

1. **Yamada M**, Han X, Benfey PN
Root meristem Growth Factor 1 (RGF1) controls root meristem size through reactive oxygen species (ROS) signaling. *Under review at Nature*
bioRxiv: doi: <https://doi.org/10.1101/244947>
2. Li S*, **Yamada M***, Han X, Ohler U, Benfey PN
High resolution RNA expression map of the *Arabidopsis* root reveals alternative splicing and lincRNA regulation. Dev Cell. 2016 Nov 21;39(4):508-522. doi: 10.1016/j.devcel.2016.10.012. Epub 2016 Nov 10. * Co-first author
3. Tong W, Imai A, Tabata R, Shigenobu S, Yamaguchi K, **Yamada M**, Hasebe M, Sawa S, Motose H, Takahashi T. Polyamine Resistance Is Increased by Mutations in a Nitrate Transporter Gene NRT1.3 (AtNPF6.4) in *Arabidopsis thaliana*. Front Plant Sci. 2016 Jun 13;7:834.
4. Shimizu N, Ishida T, **Yamada M**, Shigenobu S, Tabata R, Kinoshita A, Yamaguchi K, Hasebe M, Mitsumasu K, Sawa S. BAM 1 and RECEPTOR-LIKE PROTEIN KINASE 2 constitute a signaling pathway and modulate CLE peptide-triggered growth inhibition in *Arabidopsis* root. New Phytol. 2015 Dec 208 (4):1104–1113.
5. Teh OK, Hatsugai N, Tamura K, Fuji K, Tabata R, Yamaguchi K, Shingenobu S, **Yamada M**, Hasebe M, Sawa S, Shimada T, Hara-Nishimura I. BEACH-domain proteins act together in a cascade to mediate vacuolar protein trafficking and disease resistance in *Arabidopsis*. Mol Plant 2015 Mar;8(3):389-98.
6. Kinoshita A, ten Hove CA, Tabata R, **Yamada M**, Shimizu N, Ishida T, Yamaguchi K, Shigenobu S, Takebayashi Y, Iuchi S, Kobayashi M, Kurata T, Wada T, Seo M, Hasebe M, Blilou I, Fukuda H, Scheres B, Heidstra R, Kamiya Y, Sawa S. A plant U-box protein, PUB4, regulates asymmetric cell division and cell proliferation in the root meristem. Development. 2015 Feb 1;142(3):444-53.

**Curriculum Vitae
Masashi Yamada**

7. Ishida T*, Tabata R*, **Yamada M***, Aida M, Mitsumasu K, Fujiwara M, Yamaguchi K, Shigenobu S, Higuchi M, Tsuji H, Shimamoto K, Hasebe M, Fukuda H, Sawa S. Heterotrimeric G proteins control stem cell proliferation through CLAVATA signaling in *Arabidopsis*. EMBO Rep. 2014 Nov;15(11):1202-9. * Co-first author
8. Tabata R, Kamiya T, Shigenobu S, Yamaguchi K, **Yamada M**, Hasebe M, Fujiwara T, Sawa S. Identification of an EMS-induced causal mutation in a gene required for boron-mediated root development by low-coverage genome re-sequencing in *Arabidopsis*. Plant Signal Behav. 2012 Oct 26;8(1). doi:pii: e22534.
9. **Yamada, M.**, Greenham, K., Prigge, M. J., Jensen, P. J. and Estelle, M. The TRANSPORT INHIBITOR RESPONSE2 gene is required for auxin synthesis and diverse aspects of plant development. *Plant Physiol.* 2009. 151, 168-79. **F1000 Recommendation**
10. Dharmasiri N, Dharmasiri S, Weijers D, Lechner E, **Yamada M**, Hobbie L, Ehrismann JS, Jurgens G, Estelle M Plant development is regulated by a family of auxin receptor F box proteins. Dev Cell. 2005 Jul;9(1):109-19.
11. Ljung K, Hull AK, Celenza J, **Yamada M**, Estelle M, Normanly J, Sandberg G Sites and regulation of auxin biosynthesis in *Arabidopsis* roots. Plant Cell. 2005 Apr;17(4):1090-104.
12. Ogiwara N, Usuda N, **Yamada M**, Johkura K, Kametani K, Nakazawa A. Quantification of protein A-gold staining for peroxisomal enzymes by confocal laser scanning microscopy. J Histochem Cytochem. 1999 Oct;47(10):1343-9.
13. Asaoka-Taguchi M*, **Yamada M***, Nakamura A, Hanyu K, Kobayashi S. Maternal Pumilio acts together with Nanos in germline development in *Drosophila* embryos. Nat Cell Biol. 1999 Nov;1(7):431-7. * Co-first author
14. Kobayashi S*, **Yamada M***, Asaoka M*, Kitamura T. Essential role of the posterior morphogen nanos for germline development in *Drosophila*. Nature. 1996 Apr 25;380(6576):708-11 * Co-first author

Reviews

1. **Yamada M.** Functions of long intergenic non-coding (linc) RNAs in plants. J Plant Res. 2016 Dec 20. doi: 10.1007/s10265-016-0894-0.
2. **Yamada M**, Sawa S. The roles of peptide hormones during plant root development. Curr Opin Plant Biol. 2013 Feb;16(1):56-61.
3. Betsuyaku S, Sawa S, **Yamada M**. The Function of the CLE peptides in Plant Development and Plant-Microbe Interactions. Arabidopsis Book. 2011;9:e0149. doi: 10.1199/tab.0149.

ORAL PRESENTATIONS

2019

Seminar at National Cheng Kung University, Taiwan

Japan-Taiwan Plant Biology 2019 meeting at Nagoya University, Japan

Seminar (Invited speaker) at TARA international symposium at University of Tsukuba, Japan

2018

Seminar at Institute of Genetics and Developmental Biology, the Chinese Academy of Sciences (Beijing, China)

Seminar at Agricultural Biotechnology Research Center, Academia Sinica, (Taiwan)

2016

Post-transcriptional Gene Regulation in Plants Meeting (Austin, TX, U.S.A.)

American Society of Plant Biologists (ASPB) meeting (Austin, TX, U.S.A.)

The first international conference on plant meristem biology (Invited speaker) (China)

2015

48th Annual Meeting - Japanese Society of Developmental Biologists (Tsukuba, Japan)

Cold Spring Harbor Asia Conferences Plant Cell and Developmental Biology (China)

Post-transcriptional Gene Regulation in Plants Meeting (France)

The 79th Annual Meeting of the Botanical Society of Japan (Invited speaker) (Niigata, Japan)

Seminar at University of Tsukuba (Japan)

Seminar at University of Tokyo (Komaba, Japan)

2014

Cold Spring Harbor Laboratory Conference on Regulatory & Non-Coding RNAs (New York, U.S.A.)

The 38th NAITO conference on Molecule-based Biological Systems (Japan)

Seminar at RIKEN (Japan)

Seminar at University of Tokyo (Japan)

Seminar at University of Hokkaido (Japan)

Seminar at NARA Institute of Science and Technology (Japan)

2013

Cold Spring Harbor Asia Conferences Plant Cell and Developmental Biology (China)

Seminar at RIKEN (Japan)

Seminar at Nagoya University (Japan)

2010

Seminar at Utrecht University (Netherlands)

The 51st Japanese Society of Plant Physiologists (Japan)

21st International Conference on Arabidopsis Research

2008

The 72nd Botanical Society of Japan (Japan)

2007

The international plant growth substances association (IPGSA) meeting, (Perto Vallarta, Mexico)

The 30th Annual Meeting of the Molecular Biology Society of Japan (Japan)

2005

***Arabidopsis* meeting, (Madison, WI, U.S.A.)**