

CURRICULUM VITAE

NAME: (Family name) MITSUI (Forenames) Toshiaki

Sex: Male

Birth 19 January, 1959, Osaka Japan

Present Address: Graduate School of Science and Technology, Niigata University
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Education:

1977-1981 Faculty of Science and Engineering, Ritsumeikan University (Kyoto)
Awarded the degree of B.Sc. in Chemistry

1981-1983 Graduate School of Biochemical Regulation, Nagoya University
Awarded the degree of M.Sc. in Plant Biochemistry

1983-1986 Graduate School of Biochemical Regulation, Nagoya University
Awarded the degree of Ph.D. in Plant Biochemistry
Work supervised by Professor Takashi Akazawa

Research and Professional Appointments:

1986-1986 Postdoctoral Fellow of the Japan Society for the Promotion of Science

1986-1993 Assistant Professor of the Department of Applied Biological Chemistry, Niigata University

1993-1997 Associate Professor of the Department of Applied Biological Chemistry, Niigata University

1997-2002 Associate Professor of the Graduate School of Science and Technology, Niigata University

2002-present Professor of the Department of Applied Biological Chemistry, Niigata University

Awards:

1999.3 JSBBA Award for Young Scientists (The Agricultural Chemical Society of Japan)

Research Interest:

“Golgi-to-Plastid Traffic in Higher Plant Cells”

“Molecular Mechanisms of Regulation of Starch Metabolism in Rice”

“Molecular Mechanisms of Chalking of Rice Grain under High-temperature and High-CO₂ Environments”

Publications (selected): 109 (total amount of publications in SCI journals: 94)

1. K. Kaneko, T. Takamatsu, T. Inomata, K. Oikawa, K. Itoh, K. Hirose, M. Amano, S. Nishimura, K. Toyooka, K. Matsuoka, J. Pozueta-Romero, T. Mitsui: *N*-glycomic and microscopic subcellular localization analyses of NPP1, 2 and 6 strongly indicate that trans-Golgi compartments participate in the Golgi-to-plastid traffic of nucleotide pyrophosphatase/phosphodiesterases in rice. *Plant Cell Physiol.*, 57: 1610-1628, 2016.
2. K. Kaneko, M. Sasaki, N. Kuribayashi, H. Suzuki, Y. Sasuga, T. Shiraya, T. Inomata, K. Itoh, M. Baslam, T. Mitsui: Proteomic and glycomic characterization of rice chalky grains produced under moderate and high-temperature conditions in field system. *Rice*, 9:26 (doi:10.1186/s12284-016-0100-y).

3. T. Shiraya, T. Mori, T. Maruyama, M. Sasaki, T. Takamatsu, K. Oikawa, K. Itoh, K. Kaneko, H. Ichikawa and T. Mitsui: Golgi/plastid-type manganese superoxide dismutase involved in heat-stress tolerance during grain filling of rice. *Plant Biotechnol. J.*, 13(9), 1251-1263, 2015.
4. K. Oikawa, S. Matsunaga, S. Mano, M. Kondo, K. Yamada, M. Hayashi, T. Kagawa, A. Kadota, W. Sakamoto, S. Higashi, M. Watanabe, T. Mitsui, T. Iino, Y. Hosokawa, A. Shigemasa and M. Nishimura : Physical interaction between peroxisomes and chloroplasts elucidated by *in situ* laser analysis. *Nat. Plants*, 1, article number: 15035, 2015.
5. A. Ochiai, H. Sugai, K. Harada, S. Tanaka, Y. Ishiyama, K. Ito, T. Tanaka, T. Uchiumi, M. Taniguchi, T. Mitsui: Crystal structure of α -amylase from *Oryza sativa*: Molecular insights into enzyme activity and thermostability. *Biosci. Biotechnol. Biochem.*, 78(6), 989-997, 2014. (Award for Excellence to Authors Publishing in Bioscience, Biotechnology, and Biochemistry in 2014)
6. K. Kaneko, T. Inomata, T. Masui, T. Koshu, Y. Umezawa, K. Itoh, J. Pozueta-Romero, T. Mitsui: Nucleotide Pyrophosphatase/phosphodiesterase 1 exerts a negative effect on starch accumulation and growth in rice seedlings under high temperature and CO₂ concentration conditions. *Plant Cell Physiol.*, 55(2), 320-332, 2014.
7. M. Hakata, M. Kuroda, T. Miyashita, T. Yamaguchi, M. Kojima, H. Sakakibara, T. Mitsui, H. Yamakawa: Suppression of α -amylase genes improves quality of rice grain ripened under high temperature. *Plant Biotechnol. J.*, 10(9), 1110-1117, 2012.
8. K. Tanaka, N. Umeki, T. Mitsui, Z. Fujimoto, S. Maruta: Crystallographic analysis reveals a unique conformation of the ADP-bound novel rice kinesin K16. *Biochem. Biophys. Res. Commun.*, 401, 251-256, 2010.
9. A. Kitajima, S. Asatsuma, H. Okada, Y. Hamada, K. Kaneko, Y. Nanjo, Y. Kawagoe, K. Toyooka, K. Matsuoka, A. Nakano, T. Mitsui: The rice α -amylase glycoprotein is targeted from the Golgi apparatus through the secretory pathway to the plastids. *Plant Cell*, 21, 2844-2858, 2009.
10. K. Toyooka, Y. Goto, S. Asatsuma, M. Koizumi, T. Mitsui, K. Matsuoka: A mobile secretory vesicle cluster involved in mass transport from the Golgi to the plant cell exterior. *Plant Cell*, 21, 1212-1229, 2009.
11. F.J. Munoz, E. Baroja-Fernandez, M. Ovecka, J. Li, T. Mitsui, M.T. Sesma, M. Montero, A. Bahaji, I. Ezquer, J. Pozueta-Romero: Plastidial localization of a potato 'Nudix' hydrolase of ADP-glucose linked to starch biosynthesis. *Plant Cell Physiol.*, 49, 1734-1746, 2008.
12. Y. Nanjo, H. Oka, N. Ikarashi, K. Kaneko, A. Kitajima, T. Mitsui, F. J. Munoz, M. Rodriguez-Lopez, E. Baroja-Fernandez and J. Pozueta-Romero: Rice plastidial *N*-glycosylated nucleotide pyrophosphatase/phosphodiesterase is transported from the ER-Golgi to the chloroplast through the secretory pathway. *Plant Cell*, 18, 2582-2592, 2006.
13. S. Asatsuma, C. Sawada, A. Kitajima, T. Asakura and T. Mitsui: α -Amylase Affects Starch Accumulation in Rice Grain. *J. Appl. Glycosci.*, 53, 187-192, 2006.
14. N. Umeki, T. Mitsui, N. Umezu, K. Kondo and S. Maruta: Preparation and characterization of a novel rice plant-specific kinesin. *J. Biochem.*, 139, 645-654, 2006.
15. S. Asatsuma, C. Sawada, K. Itoh, M. Okito, A. Kitajima and T. Mitsui: Involvement of alpha-amylase I-1 in

starch degradation in rice chloroplasts. *Plant Cell Physiol.*, 46(6), 858-869, 2005.

16. R. B. Day, S. Tanabe, M. Koshioka, T. Mitsui, H. Itoh, M. Ueguchi-Tanaka, M. Matsuoka, H. Kaku, N. Shibuya and E. Minami: Two rice GRAS family genes responsive to N-acetylchitoooligosaccharide elicitor are induced by phytoactive gibberellins: evidence for cross-talk between elicitor and gibberellin signaling in rice cells. *Plant Mol. Biol.*, 54, 261-272, 2004.
17. Y. Nanjo, S. Asatsuma, K. Itoh, H. Hori and T. Mitsui: Proteomic identification of alpha-amylase isoforms encoded by RAmy3B/3C from germinating rice seeds. *Biosci. Biotechnol. Biochem.*, 68, 112-118, 2004.
18. K. Itoh, H. Ozaki, K. Okada, H. Hori, Y. Takeda and T. Mitsui: Introduction of Wx transgene into rice wx mutants leads to both high- and low-amylose rice. *Plant Cell Physiol.*, 44, 473-480, 2003.
19. S. Mikami, H. Hori, T. Mitsui: Separation of distinct compartments of rice Golgi complex by sucrose density gradient centrifugation. *Plant Sci.*, 161, 665-675, 2001.
20. T. Mitsui, T. Loboda, A. Itoh, T. Ikarashi: Sugar-controlled Ca²⁺ uptake and α -amylase secretion in cultured cells of rice (*Oryza sativa* L.). *Plant Cell Physiol.*, 40, 884-893, 1999.
21. R. Ikebe, S. Reardon, T. Mitsui, M. Ikebe: Role of the N-terminal Region of the Regulatory Light Chain in the Dephosphorylation of Myosin by Myosin Light Chain Phosphatase. *J. Biol. Chem.*, 274, 30122-30126, 1999.
22. M.A. Kashem, H. Hori, K. Itoh, T. Hayakawa, Y. Todoroki, N. Hirai, H. Ohigashi, T. Mitsui: Effects of (+)-8',8',8'-trifluoroabscisic acid on α -amylase expression and sugar accumulation in rice cells. *Planta*, 205, 319-326, 1998.
23. T. Mitsui, K. Itoh: The α -amylase multigene family. *Trends Plant Sci.*, 2, 255-261, 1997.
24. T. Mitsui, J. Yamaguchi, T. Akazawa: Physicochemical and serological characterization of rice α -amylase isoforms and identification of their corresponding genes. *Plant Physiol.*, 110(4), 1395-1404, 1996.
25. T. Mitsui, M. Honma, T. Kondo, N. Hashimoto, S. Kimura, I. Igaue: Structure and function of the Golgi complex in rice cells. 2. Purification and characterization of Golgi membrane-bound nucleoside diphosphates. *Plant Physiol.*, 106, 119-125, 1994.
26. T. Mitsui, T. Kitazawa, M. Ikebe: Correlation between high temperature dependence of smooth muscle myosin light chain phosphatase activity and muscle relaxation rate. *J. Biol. Chem.*, 269, 5842-5848, 1994.
27. K. Yotsushima, T. Mitsui, T. Takaoka, T. Hayakawa, I. Igaue: Purification and characterization of membrane-bound inositol phospholipid-specific phospholipase C from suspension-cultured rice (*Oryza sativa* L.) cells: Identification of a regulatory factor. *Plant Physiol.*, 102, 165-172, 1993.
28. T. Mitsui, M. Inagaki, M. Ikebe: Purification and characterization of smooth muscle myosin-associated phosphatase from chicken gizzards. *J. Biol. Chem.*, 267, 16727-16735, 1992.
29. M. Hayashi, A. Turu, T. Mitsui, N. Takahashi, H. Hanzawa, Y. Arata, T. Akazawa: Structure and biosynthesis of the xylose-containing carbohydrate moiety of rice α -amylase. *Eur. J. Biochem.*, 191(2), 287-295, 1990.
30. T. Mitsui, T. Akazawa: Preferential secretion of R-type α -amylase molecules in rice seed scutellum at high temperature. *Plant Physiol.*, 82(3), 880-884, 1986.
31. T. Mitsui, J.T. Christeller, I. Hara-Nishimura, T. Akazawa: Possible roles of calcium and calmodulin in the biosynthesis and secretion of α -amylase in rice scutellar epithelium. *Plant Physiol.*, 75(1), 880-884, 1985.

Recipient of research grants during last 10 years, since 2007

2017	JST SICORP, EIG-CONCERT-Japan	Main applicant	2017-2019	18,031,000yen
2015	JSPS Grants-in-Aid for Scientific Research (A)	Main applicant	2015-2018	41,600,000yen
2015	JSPS Grants-in-Aid for Scientific Research (B)	Co-applicant	2015-2017	3,575,000yen
2015	JSPS Grants-in-Aid for Scientific Research (B)	Co-applicant	2015-2018	4,550,000yen
2013	MEXT Management Expenses Grants (KAAB project)	Main applicant	2013-2017	127,048,000yen
2011	JST/ALCA	Main applicant	2011-2012	5,000,000yen
2010	JSPS Grant-in-Aid for Scientific Research on Innovative Areas	Main applicant	2010-2011	46,930,000yen
2010	JSPS Grants-in-Aid for Scientific Research (B)	Main applicant	2010-2013	18,200,000yen
2008	AFFRC Genomics for Agricultural Innovation Grant	Main applicant	2008-2012	45,000,000yen

“Towards a multi-approach study focused on improving resource use efficiency in cereals under climate change (IRUEC)” Japan Science and Technology Agency (JST) Strategic International Collaborative Research Program (16817624), 2017.4-2020.3, 18,031,000 yen

“Development of rice adapted to high temperature and CO₂ environments” Japan Society for the Promotion of Science (JSPS) KAKENHI Grants-in-Aid for Scientific Research (A) (15H02486), 2015.4-2019.3, 41,600,000 yen

“Development of processed rice with good taste and indigestible and elucidation of functional expression mechanism by biological and physical methods” Japan Society for the Promotion of Science (JSPS) KAKENHI Grants-in-Aid for Scientific Research (B) (15H02891), 2015.4-2018.3, 3,575,000 yen

“Low reactivity of grain growth against high temperature and high temperature ripening tolerance of rice that focused on high carbon dioxide assimilation function” Japan Society for the Promotion of Science (JSPS) KAKENHI Grants-in-Aid for Scientific Research (B) (15H04444), 2015.4-2019.3, 4,550,000 yen

“Plastid targeting of glycoproteins involved in starch metabolism of rice” JSPS KAKENHI Grants-in-Aid for Scientific Research (B) (22380186), 2010.4-2014.3, 18,200,000 yen

“Molecular physiological characterization of npp1 rice mutant response to high temperature and CO₂ environments” JSPS KAKENHI Grants-in-Aid for Scientific Research on Innovation Areas (22114507, 24114705), 2010.4-2014.3, 46,930,000 yen

Membership in Scientific Societies:

The Japanese Society of Plant Physiologists

The Japanese Biochemical Society

The Agricultural Chemical Society of Japan

The Japanese Society of Applied Glycoscience

Japanese Proteomics Society

Crop Science Society of Japan

The American Society for the Plant Physiologists