Kimiko ITOH, Ph.D.

Professor
Program: Life and Food Sciences
Area: Appied Life and Food Sciences
Undergraduate: Dept. of Applied Biochemistry
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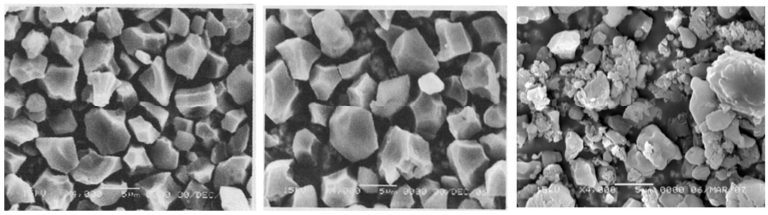
Professional Expertise

Plant molecular biology (regulation of gene expression in transgenic rice), Applied glycoscience (especially starch biosynthesis in rice grains), and Applied biological chemistry.

Research Fields of Interest

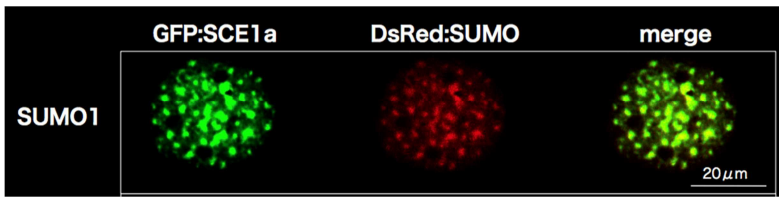
Recent my research is focused on 1) developing novel starch structure, enhancing the versatility of the starch, 2) comparative studies of rice seed proteome among rice varieties carry different type of starches and 3) regulation of plant protein modification under thermo-stress conditions by SUMO modification system. Eventual goal of these researches is to develop high-yielding and high-quality rice, and utilization of rice starch.

Genetically control of starch grain size and the properties.



Genetically control of Height and flowering.

E2 enzyme interact with SUMO in nucleus.



Education

1994: Ph.D. in Science, Toho University, Japan
1983: B.S. in Biology, Faculty of Science, Toho University, Japan

Career

2016: Professor, Niigata University, Faculty of Agriculture.
1999: Associate Professor, Niigata University, Graduate School of Science and Technology
1993: Assistant Professor, Niigata University, Faculty of Agriculture
1983-1993: Plantech Research Institute, Mitsubishi Chemical Cooporation.

Professional Societies and Activities

1. Member of American Society of Plant Biology
2. Member of Japanese Society of Plant Physiology
3. Member, and Editorial board of Japanese Society of Applied Glycoscience
4. Member of Japanese Society of Genetics
5. Member of Japanese Society of Molecular Biology
6. Member of Japanese Society for Bioscience, Biotechnology, and Agrochemistry
7. Member of Japanese Scociety for Plant Cell and Molecular Biology
8. Member of Japanese Proteomics Society

Major Publications

Papers

1. Golgi/plastid-type manganese superoxide dismutase involved in heat-stress tolerance during grain filling of rice, T. Shiraya, T. Mori, T. Maruyama, M. Sasaki, T. Takamatsu, K. Oikawa, K. Itoh, K. Kaneko, H. Ichikawa and T. Mitsui , Plant Biotechnology Journal , Vol.13, No.9, pp.1251-1263, 2015

2. Determination of genomic location and structure of the transgenes in marker-free rice-based cholera vaccine by using whole genome resequencing approach. M Mejima, K Kashima, M Kuroda, N Takeyama, S Kurokawa, Y Fukuyama, H Kiyono, K Itoh, T Mitsui, Y Yuki. *Plant Cell Tiss Org Cult*, **2014**

3. Nucleotide pyrophosphatase/ phosphodiesterase 1 exerts a negative effect on starch accumulation and growth in rice seedlings under high temperature and CO2 concentration conditions. K Kaneko, T Inomata, T Masui, T Koshu, Y Umezawa, K Itoh, P-R Javier, T Mitsui. *Plant Cell Physiol*., **2014**, vol. 55, pp. 320-332

4.Lack of starch synthase IIIa and high expression of granule-b ound starch synthase I synergistically increase the apparent amyl ose content in rice endosperm. N Crofts, K Abe, Sihara S, Itoh R, Y. Nakamura, K Itoh , N Fujita. *Plant Sci*. **2012**, vol. 193-194, pp. 62-9.

5.Differential localization and functions of rice nucleotide pyrophosphatase/ phosphodiesterase isozymes 1 and 3. K Kaneko, C Yamada, A Yanagida, T Koshu, Y Umezawa, K Itoh, H Hori, T Mitsui, *Plant Biotech*.**2011**, vol. 28, pp. 69-76.

6. Isoform-specific localization of *Brassica rapa* nitrilases in root infected with *Plasmodiophora brassicae* revealed using in situ hybridization probes improved with locked nucleic acids. T Ishikawa, K Okazaki, T Nagaoka, K Itoh, T Mitsui, H Hori *J. Plant Growth Regulation*, **2010**/12, Vol.29, pp. 210-222

7.Structures of endosperm starch from a rice *wx* cultivar expressing Wx^a transgene. I Hanashiro. Wakayama T., M Hasegawa, Higuchi T., K Itoh, T Fukuyama, Y Takeda. *J. Appl. Glycosci.* **2009**, vol. 56, pp. 65−70

8.Granule-bound starch synthase I is responsible for biosynthesis of extra-long chain of amylopectin in rice.I Hanashiro, K Itoh, Y Kuratomi, M Yamazaki, T Igarashi, J Matsugasako, Y Takeda. *Plant Cell Physiol.* **2008**/6, 49: 925−933

10.T Asakura, S Hirose Y Nanjo, T Nakaizumi, K Itoh, H Hori, S Komatsu, T Mitsui: Proteomic characterization of tissue expansion of rice scutellum stimulated by abscisic acid. (2007) **Bioscience, Biotechnology, Biochemistry**71, 1260-1268,

11.T. Ishikawa, K. Okazaki, H. Kuroda, K. Itoh, T. Mitsui. H. Hori : Molecular cloning of Brassica rapa nitrilases and their expression during clubroot development. (2007) **Mol. Plant Pathol** 8, 623-637

12. H. Kondo, H. Ozaki, K. Itoh, A. Kato, K. Takeno :Flowering induced by 5-azacytidine, a DNA demethylating reagent in a short-day plant, Perilla frutescens var. crispa. (2006) **Physiol. Plant.** 127:130-137

13.S.M.S. Islam, T. Miyazaki, F. Tanno, K. Itoh: Dissection of gene function by RNA silencing. (2005) **Plant Biotechnology**, 22,443-446.

14.Y.Nanjo, S. Asatsuma, K. Itoh, H.Hori, T. Mitsui, Y.Fujisawa. Posttranscriptional regulation of a-amylase expression by giberellin in germinating rice seeds. (2004) **Plant Physiol. Biochem**. 42,477-484

15. Asatsuma,Y. Nanjo, M.A. Kashem, K. Itoh, H. Hori, M. Ohshima, T. Mitsui: Phosphate modulates Ca2+ uptake and a-amylase secretion in suspension-cultured cells of rice. **Plant Biotech**., 20(3), 217-224, 2003.

16.K Itoh, H Ozaki, K Okada, H Hori, Y Takeda, 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)

17. M. A. Kashem, K.Itoh, Y. Todoroki, N. Hirai, H. Ohigashi, T. Hayakawa, T. Mitsui. Effects of 8'8'8'- Trifuluoroabscisic Acid on α-Amylase secretion and Sugar accumulation (1998) *Planta*, 205: 319-326

18. T. Mitsui, K. Itoh :The α-amylase multigene family. (1997) *Trends in Plant Science* .2, pp.255-261

19. K. Itoh, M. Nakajima, K. Shimamoto Silencing of *waxy* genes in rice containing *Wx* transgenes. (1997) *Mol. Gen. Genet* .255, . 351-358

20. M.Yamagishi, K.Itoh, T.Koba, Y.Sukekiyo, K. Shimam- oto, T. Shimada. Characteristics of genetic variation in the progenies of protoplast-derived plants of rice, *Oryza sativa* cv. Nipponbare (1997) *Theor. Appl. Genet.* 94, 1-7

18. K. Itoh, J. Yamaguchi, N. Huang, R. L. Rodriguez, T. Akazawa, K. Shimamoto. Developmental and hormonal regulation of rice α-amylase (*RAmy1A*)-*gusA* fusion genes in transgenic rice seeds. (1995) *Plant Physiol*.107, 25-3

19. H. Fujimoto, K. Itoh, M. Yamamoto, J. Kyozuka, K. Shimamoto: Insect resistance rice generated by introduction of a modified δ-endotoxin gene of *Bacillus thuringiensis*. (1993) *Bio/ Technology*, 11, 1151-1155