Link to Research Activity

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Education:

B.S. Life science, Tokyo Institute of Technology, March, 1997

M.S. Life science, Tokyo Institute of Technology, March, 1999

Ph.D. Life science, Tokyo Institute of Technology, September, 2001

Professional Career:

2001-2003: Postdoctoral Researcher, ATP System Project, Tokyo Institute of Technology

2003-2006: Researcher, Bio-frontier Laboratories, Kyowa Hakko Kogyo, Co. Ltd.

2006-2009: Research Associate, Consolidated Research Institute for Advanced Science and Medical Care, Waseda University

2009- : Assistant Professor, Organization of Advanced Science and Technology, Kobe University

2012- : Associate Professor, Organization of Advanced Science and Technology, Kobe University

2015- : Associate Professor, Graduate School of Nutritional and Environmental Sciences, University of Shizuoka

Research Interests

- Energetic Cell Factory
- Synthetic Bioengineering
- Metabolic Engineering
- Fine Chemical Production
- Biorefinery

Review:

Kiyotaka Y. Hara, Akihiko Kondo (2015) ATP regulation in bioproduction. Microb Cell Factories **14,** 198.

Kiyotaka Y. Hara, Michihiro Araki, Naoko Okai, Satoshi Wakai, Tomohisa Hasunuma, Akihiko Kondo (2014) Development of bio-based fine chemical production through synthetic bioengineering. Microb Cell Factories **13(1)**, 173.

Tomohisa Hasunuma, Fumio Okazaki, Naoko Okai, Kiyotaka Y. Hara, Jun Ishii, Akihiko Kondo (2013) A review of enzymes and microbes for lignocellulosic biorefinery and the possibility of their application to consolidated bioprocessing technology. Bioresourse Technology **135**, 513-522.

Akihiko Kondo, Jun Ishii, Kiyotaka Y. Hara, Tomohisa Hasunuma, Fumio Matsuda (2013) Development of microbial cell factories for bio-refinery through synthetic bioengineering. Journal of Biotechnology **163(2)**, 204-216.

Journal articles:

Kobayashi J, Sasaki D, Hara KY, Hasunuma T, Kondo A. (2017) Enzymatic improvement of mitochondrial thiol oxidase Erv1 for oxidized glutathione fermentation by Saccharomyces cerevisiae. Microb Cell Fact, in press.

Yamamoto K, Hara KY (equal contribution), Morita T, Nishimura A, Sasaki D, Ishii J, Ogino C, Kizaki N, Kondo A. (2016) Enhancement of astaxanthin production in Xanthophyllomyces dendrorhous by efficient method for the complete deletion of genes. Microb Cell Fact. 15(1):155.

Ishii J, Okazaki F, Djohan AC, Hara KY, Asai-Nakashima N, Teramura H, Andriani A, Tominaga M, Wakai S, Kahar P, Yopi, Prasetya B, Ogino C, Kondo A. (2016) From mannan to bioethanol: cell surface co-display of β-mannanase and β-mannosidase on yeast Saccharomyces cerevisiae. Biotechnol Biofuels. 9(1):188.

Nishida K, Arazoe T, Yachie N, Banno S, Kakimoto M, Tabata M, Mochizuki M, Miyabe A, Araki M, Hara KY, Shimatani Z, Kondo A. (2016)Targeted nucleotide editing using hybrid prokaryotic

and vertebrate adaptive immune systems. Science. 353 (6305).

Sasaki K, Hara KY (equal contribution), Kawaguchi H, Sazuka T, Ogino C, Kondo A. (2016) Nanofiltration concentration of extracellular glutathione produced by engineered *Saccharomyces cerevisiae*. J Biosci Bioeng **121,** 96-100.

Hara KY, Aoki N, Kobayashi J, Kiriyama K, Nishida K, Araki M, Kondo A. (2015) Improvement of oxidized glutathione fermentation by thiol redox metabolism engineering in *Saccharomyces cerevisiae*. Appl Microbiol Biotechnol **99,** 9771-9778.

Inokuma K, Ishii J, Hara KY, Mochizuki M, Hasunuma T, Kondo A. (2015) Complete Genome Sequence of *Kluyveromyces marxianus* NBRC1777, a Nonconventional Thermotolerant Yeast. Genome Announc. 3(2).

Ye X, Morikawa K, Ho SH, Araki M, Nishida K, Hasunuma T, Hara KY (Corresponding author), Kondo A. (2015) Evaluation of genes involved in oxidative phosphorylation in yeast by developing a simple and rapid method to measure mitochondrial ATP synthetic activity. Microb Cell Fact **14,** 56.

Hideo Kawaguchi, Hiroshi Teramura, Kouji Uematsu, Kiyotaka Y. Hara, Tomohisa Hasunuma, Ko Hirano, Takashi Sazuka, Hidemi Kitano, Yota Tsuge, Prihardi Kahar, Satoko Niimi-Nakamura, Ken-Ichi Oinuma, Naoki Takaya, Shigemitsu Kasuga, Chiaki Ogino, and Akihiko Kondo (2015) Phenyllactic acid production by simultaneous saccharification and fermentation of pretreated sorghum bagasse. Bioresource Technology, **182,** 169-178.

Kiyotaka Y. Hara, Toshihiko Morita, Masao Mochizuki, Keisuke Yamamoto, Chiaki Ogino, Michihiro Araki, Akihiko Kondo (2014) Development of a multi-gene expression system in *Xanthophyllomyces dendrorhous*. Microbial Cell Factories **13(1)**, 175.

Michihiro Araki, Robert Sidney Cox III, Hiroki Makiguchi, Teppei Ogawa, Takeshi Taniguchi, Kohei Miyaoku, Masahiko Nakatsui, Kiyotaka Y. Hara, Akihiko Kondo (2014) M-path: a compass for navigating potential metabolic pathways. Bioinformatics. **31(6)**, 905-911.

Kiyotaka Y. Hara, Katsuhiko Morita, Yusuke Endo, Masao Mochizuki, Michihiro Araki, Akihiko Kondo (2014) Evaluation and screening of efficient promoters to improve astaxanthin production in *Xanthophyllomyces dendrorhous*. Applied Microbiology and Biotechnology **98(15)**, 6787-6793.

Shih-Hsin Ho, Akihito Nakanishi, Xiaoting Ye, Jo-Shu Chang, Kiyotaka Hara, Tomohisa Hasunuma,

Akihiko Kondo (2014) Optimizing biodiesel production in marine *Chlamydomonas* sp.JSC4 through metabolic profiling and an innovative salinity-gradient strategy. Biotechnology for Biofuel **7**, 97.

Kentaro Kiriyama, Kiyotaka Y. Hara (equal contribution), Akihiko Kondo (2013) Oxidized glutathione fermentation using *Saccharomyces cerevisiae* engineered for glutathione metabolism. Applied Microbiology and Biotechnology **97(16)**, 7399-7404.

Kiyotaka Y. Hara, Takeyoshi Wada, Kuniki Kino, Toru Asahi, Naoya Sawamura (2013) Construction of photoenergetic mitochondria in cultured mammalian cells. Scientific Reports **3**, 1635.

Kentaro Kiriyama, Kiyotaka Y. Hara (equal contributin), Akihiko Kondo (2012) Extracellular glutathione fermentation using engineered *Saccharomyces cerevisiae* expressing novel glutathione exporter. Applied Microbiology and Biotechnology **96(4)**, 1021-1027.

Jun Ishii, Miyuki Moriguchi, Kiyotaka Y. Hara, Seiji Shibasaki, Hideki Fukuda, Akihiko Kondo (2012) Improved identification of agonist-mediated Gαi-specific human G-protein-coupled receptor signaling in yeast cells by flow cytometry. Analytical Biochemistry **426(2)**, 129-133.

Kiyotaka Y. Hara, Songhee Kim, Kentaro Kiriyama, Hideyo Yoshida, Syogo Arai, Jun Ishii, Chiaki Ogino, Hideo Fukuda, Akihiko Kondo (2012) An energy-saving glutathione production method from low-temperature cooked rice using amylase-expressing *Saccharomyces cerevisiae*. Biotechnology Journal **7(5)**, 686-689.

Kiyotaka Y. Hara, Kentaro Kiriyama, Hideo Nakayama, Akihiko Kondo (2012) Improvement of glutathione production by metabolic engineering the sulfate assimilation pathway of *Saccharomyces cerevisiae*. Applied Microbiology and Biotechnology **94(5)**, 1313-1319.

Kiyotaka Y. Hara, Songhee Kim, Hideyo Yoshida, Kentaro Kiriyama, Takashi Kondo, Naoko Okai, N, Chiaki Ogino, Hideo Fukuda, Akihiko Kondo (2012) Development of a glutathione production process from proteinaceous biomass resources using protease-displaying *Saccharomyces cerevisiae*. Applied Microbiology and Biotechnology **93(4)**, 1495-1502.

Hideyo Yoshida, Kiyotaka Y. Hara (equal contribution), Kentro Kiriyama, Hideo Nakayama, Fumio Matsuda,Chiaki Ogino, Hideo Fukuda, Akihiko Kondo (2011) Enzymatic glutathione production using metabolically engineered *Saccharomyces cerevisiae* as a whole-cell biocatalyst., Applied Microbiology and Biotechnology **91(4)**, 1001-1006.

Kiyotaka Y. Hara, Rie Suzuki, Toshiharu Suzuki, Masasuke Yoshida, Kuniki Kino (2011) ATP photosynthetic vesicles for light-driven bioprocesses. Biotechnology Letters **33(6)**, 1133-1138.

Hideyo Yoshida, Shogo Arai, Kiyotaka Y. Hara, Ryosuke Yamada, Chiaki Ogino, Hideo Fukuda, Akihiko Kondo (2011) Efficient and direct glutathione production from raw starch using *Saccharomyces cerevisiae*. Applied Microbiology and Biotechnology **89(5)**, 1417-1422.Kiyotaka Y. Hara, Natsuka Shimodate, Yasutaka Hirokawa, Mikito Ito, Tomoya Baba, Hirotada Mori, Hideo Mori (2009) Glutathione production by efficient ATP-regenerating *Escherichia coli* mutants. FEMS Microbiology Letters **297(2)**, 217-214.

Kiyotaka Y. Hara, Natsuka Shimodate, Mikito Ito, Tomoya Baba, Hirotada Mori, Hideo Mori (2009) Systematic genome-wide scanning for genes involved in ATP generation in *Escherichia coli*. Metabolic Engineering **11(1)**, 1-7.

Kiyotaka Y. Hara, Hideo Mori (2006) An efficient method for quantitative determination of cellular ATP synthetic activity. Journal of Biomolecular Screening **11(3)**, 310-317.

Katsuya Shimabukuro, Ryohei Yasuda, Eiro Muneyuki, Kiyotaka Y. Hara, Kazuhiko Kinosita, Jr, Masasuke Yoshida (2003) Catalysis and rotation of F_1 motor: cleavage of ATP at the catalytic site occurs in 1 ms before 40 degree substep rotation. Proceedings of National Academy of Sciences of the United States of America **100(25)**,14731-14736.

Sakurako Ono, Kiyotaka Y. Hara, Jun Hirao, Tadashi Matsui, Hiroyuki Noji, Masasuke Yoshida, Eiro Muneyuki (2003) Origin of apparent negative cooperativity of F(1)-ATPase., Biochimica et Biophysica Acta -Bioenergetics **1607(1)**, 35-44.

Yoko Hirono-H, Hiroyuki Noji, Masaya Nishiura, Eiro Muneyuki, Kiyotaka Y. Hara, Ryohei Yasuda, Kazuhiko Kinosita, Jr, Masasuke Yoshida (2001) Pause and rotation of F(1)-ATPase during catalysis. Proceedings of National Academy of Sciences of the United States of America **98(24)**,13649-13654.

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Toyoki Amano, Tadashi Matsui, Eiro Muneyuki, Hiroyuki Noji, Kiyotaka Hara, Masasuke Yoshida, Toru Hisabori (1999) alpha3beta3gamma complex of F_1-ATPase from thermophilic *Bacillus* PS3 can maintain steady-state ATP hydrolysis activity depending on the number of non-catalytic sites. Biochemical Journal **343(1)**, 135-138.

Book (English):

Kiyotaka Y. Hara (2009) Methods in Molecular Biology: Methods and Protocols, Reverse Chemical Genetics (Section 2.7. Permeable Cell Assay: a method for high-throughput measurement of cellular ATP synthetic activity), Methods in Molecular Biology (Humana Press) **577**, 251-257.