

## CURROCVLUM VITAE (5th Dec., 2023)

### **Kazuaki Ishihara**

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### **BIRTH**

Born at Aichi Prefecture, Japan on April 26, 1963.

### **EDUCATION**

1982–1986: Bachelor of Engineering (under the supervision of Professor Hisashi Yamamoto), Department of Applied Chemistry, School of Engineering, Nagoya University  
1986–1988: Master of Engineering (under the supervision of Professor Hisashi Yamamoto), Department of Applied Chemistry, Graduate School of Engineering, Nagoya University  
1988–1991: Doctor of Engineering (under the supervision of Professor Hisashi Yamamoto), Department of Applied Chemistry, Graduate School of Engineering, Nagoya University  
Thesis Title: “Studies on Stereoselective Reactions of Acetals”  
[Visiting scholar under the supervision of Professor Clayton H. Heathcock at Department of Chemistry, University of Berkeley, California, USA for three months in 1987.]

### **POSITIONS HELD**

1991–1992 Postdoctoral Fellow under the supervision of Professor E. J. Corey at Department of Chemistry, Harvard University, Cambridge, Massachusetts, USA  
1992–1994 Assistant Professor, Department of Applied Chemistry, Graduate School of Engineering, Nagoya University, Japan  
1994–1997 Assistant Professor, Department of Biotechnology, Graduate School of Engineering, Nagoya University, Japan  
1997–2001 Associate Professor, Research Center of Waste and Emission Management, Nagoya University, Japan  
2001–2002 Associate Professor, Department of Biotechnology, Graduate School of Engineering, Nagoya University, Japan  
2002–present Full Professor, Department of Biotechnology, Graduate School of Engineering, Nagoya University, Japan

### **HONORS & AWARDS**

- (1) JSPS Fellowship for Japanese Junior Scientists, 1988–1991
- (2) Yamada Science Foundation Fellowship for Studying Abroad, 1991–1992
- (3) The 10<sup>th</sup> Inoue Research Award for Young Scientists, 1994 (The Inoue Foundation for Science)  
“Studies on stereoselective reactions of acetals”
- (4) The 45<sup>th</sup> Young Chemist Award from the Chemical Society of Japan, 1996 (The Chemical Society of Japan)

- “Development of high stereocontroller system of organic reactions using Brønsted acid–Lewis acid complexes”
- (5) Thieme Chemistry Journal Award, 2001 (Honorary One Year Subscription to Synlett)
  - (6) The 2<sup>nd</sup> Green & Sustainable Chemistry Award from the Minister of Education, Culture, Sports, Science and Technology, 2003 (The Green & Sustainable Chemistry Network, Japan)  
“Highly efficient organic syntheses using environmentally benign catalysts”
  - (7) The 1<sup>st</sup> JSPS Prize, 2005 (Japan Society for the Promotion of Science)  
“Development of Artificial Small-molecule Green Catalysts”
  - (8) BCSJ Award, 2005 (Bulletin of the Chemical Society of Japan)  
“Facile Synthesis of Aryl- and Alkyl-bis(trifluoromethylsulfonyl)methanes”
  - (9) Asian Core Program Lectureship Award (from Coordinator (Taiwan), March 10, 2006)  
“Rational Design of Small-molecule Artificial Enzymes Based on Acid-Base Combined Chemistry”  
0<sup>th</sup> International Conference on Cutting-Edge Organic Chemistry in Asia, Nagoya Conference Hall, Nagoya University, Nagoya, Japan; JSPS Asian Core Program; March 8–12, 2006.
  - (10) Asian Core Program Lectureship Award (from Coordinator (Korea), March 10, 2006)  
“Rational Design of Small-molecule Artificial Enzymes Based on Acid-Base Combined Chemistry”  
0<sup>th</sup> International Conference on Cutting-Edge Organic Chemistry in Asia, Nagoya Conference Hall, Nagoya University, Nagoya, Japan; JSPS Asian Core Program; March 8–12, 2006.
  - (11) Japan/UK GSC Symposium Lectureship in Japan/UK Green Sustainable Chemistry Symposium, Kansai University, Osaka; March 27, 2007 (The Chemical Society of Japan)  
“Design of dehydrative condensation catalysts based on acid–base combination chemistry”
  - (12) The 21<sup>st</sup> Japan IBM Science Prize, 2007 (IBM)  
“Design of highly functional catalysts based on acid–base combination chemistry directed towards environmentally benign organic reactions”
  - (13) Asian Core Program Lectureship Award (from Coordinator (Hong Kong), October 22, 2008)  
“2-Iodoxybenzenesulfonic acid (IBS) as an extremely active catalyst for the oxidation of alcohols to aldehydes, ketones, and carboxylic acids with oxone<sup>®</sup>”  
3rd International Conference on Cutting-Edge Organic Chemistry in Asia, Liuying Hotel, Hangzhou, China, October 19–23, 2008.
  - (14) The 5<sup>th</sup> Mukaiyama Award (administered by the Society of Synthetic Organic Chemistry, Japan) (October 16, 2009)  
“The rational design of highly functional acid–base combined catalysts”
  - (15) The 27th Inoue Prize for Science, 2011  
“Design of highly functional dynamic complex catalysts based on acid-base combination chemistry”
  - (16) Fellow of the Royal Society of Chemistry (January 11, 2013)
  - (17) SSOCJ Daiichi-Sankyo Award for Medicinal Organic Chemistry 2012 (The Society of Synthetic Organic Chemistry, Japan, February 19, 2013)  
“Development of Selective Organic Transformation Reactions Induced by Hypervalent Iodine Catalysts”
  - (18) The Yazaki Academic Award (Yazaki Memorial Foundation for Science & Technology, March 7, 2013)
  - (19) The Ichimura Prize (The New Technology Development Foundation, April 25, 2013)
  - (20) 2013–2014 AbbVie Lectureship in Organic Chemistry (Host: Professor Scott Denmark, University of Illinois at Urbana-Champaign) (September, 25, 2014)

- (21) The 2014/2015 Pacific Rim Frontiers in Chemistry Lectureship (Host: Professor Dennis Hall, University of Alberta) (2015)
- (22) Asian Core Program Lectureship Award (from Coordinator (Hong Kong), December 4, 2014) OP-21 “Catalytic enantioselective cyclization reaction to construct chroman skeletons,” The 9th International Conference on Cutting-Edge Organic Chemistry in Asia (ICCEOCA-9)/The 5<sup>th</sup> New Phase International Conference on Cutting-Edge Organic Chemistry in Asia (NICCEOCA-5), Eastin Hotel Petaling Jaya, Malaysia. December 1–4, 2014.
- (22) Asian Core Program Lectureship Award (from Coordinator (Taiwan), December 4, 2014) OP-21 “Catalytic enantioselective cyclization reaction to construct chroman skeletons,” The 9th International Conference on Cutting-Edge Organic Chemistry in Asia (ICCEOCA-9)/The 5<sup>th</sup> New Phase International Conference on Cutting-Edge Organic Chemistry in Asia (NICCEOCA-5), Eastin Hotel Petaling Jaya, Malaysia. December 1–4, 2014.
- (23) The SIS Award 2015 (from the Society of Iodine Science, September 15, 2015)
- (24) Synthetic Organic Chemistry Award, Japan (The Society of Synthetic Organic Chemistry (SSOCJ), Japan, February 18, 2016)
- (25) Asian Core Program / Advanced Research Network Lectureship Award (from Coordinator (Korea), October 30, 2016)  
 PO-C15 “Enantioselective Carbon–Carbon Bond Formation Reactions Induced by Chiral BINSA-Derived Brønsted Acid Catalysts,” ACP-2016-Korea (The 11th International Conference on Cutting-Edge Organic Chemistry in Asia (ICCEOCA-11) & The 2nd Advanced Research Network on Cutting-Edge Organic Chemistry in Asia (ARNCEOCA-2), Fusion Hall, KI Institute (KAIST), Daejeon, Korea.  
 October 27–30, 2016.
- (26) Prize for Science and Technology (Research Category) in the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, April 19, 2017.
- (27) Asian Core Program / Advanced Research Network Lectureship Award (from Coordinator (Hong Kong), November 5, 2017)  
 PO-B19 “Enantioselective Hydrocyanation of Ketones and  $\alpha,\beta$ -Unsaturated *N*-Acylpyrroles Catalyzed by Chiral Lithium(I) Phosphoryl Phenoxide,” ACP-2017-China (The 12th International Conference on Cutting-Edge Organic Chemistry in Asia (ICCEOCA-12) & The 3rd Advanced Research Network on Cutting-Edge Organic Chemistry in Asia (ARNCEOCA-3), Xi’an, China.  
 November 2–5, 2017.
- (27) JSPC Award for Excellence (The Japanese Society for Process Chemistry)  
 Yushi Tabata, Manabu Hatano, and Kazuaki Ishihara\*  
 “Transesterification Reaction highly Active Catalyzed by Quaternary Ammonium Salts”  
 Dec. 8, 2017, The Winter Symposium of JSPC 2017 (Nagasaki Brick Hall)
- (28) CSJ Award 2017 (The Chemical Society of Japan)  
 “Rational Design of High Performance Acid–Base Combined Catalysts”  
 March 21, 2018

### **EDITORIAL ADVISORY BOARD**

- (1) 2007– Editorial Advisory Board of “**Letters in Organic Chemistry**”, Bentham Science Publishers Ltd., U.A.E.  
<http://www.bentham.org/loc/index.htm>

- (2) 2021–2024 Editorial Board of “**Asian Journal of Organic Chemistry**”, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.  
<http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%292193-5815>
- (3) 2014– The board of Series Editors of “**Topics in Current Chemistry**”, Springer-Verlag GmbH, Heidelberg, Germany  
<http://link.springer.com/bookseries/128>

### **PRINCIPLE AREAS OF RESEARCH**

- 1981–1991 Studies on stereoselective reactions of chiral acetals  
 1991–1992 Design of asymmetric Diels–Alder catalysts  
 1992– Design of chiral Brønsted acid–Lewis acid combined catalysts  
 1995– Design of superacids  
 1996– Design of dehydrative condensation catalysts  
 1999– Design of artificial cyclases for synthesizing optically active polycyclic terpenoids  
 2000– Design of recoverable and reusable catalysts  
 2002– Design of acid–base combined catalysts  
 2007– Design of hypervalent iodine catalysts  
 2009– Design of supramolecular acid–base combined catalysts  
 2023– Design of chiral photoredox catalysts

His current research is the development of catalytic organic reactions and processes directed towards green chemistry.

**286 Original papers**

**138 Review articles**

**87 Patent applications**

**381 Lectures**

### **Representative Papers**

- (1) “Direct condensation of carboxylic acids with alcohols catalyzed by hafnium(IV) salts”  
 Kazuaki Ishihara, Suguru Ohara, Hisashi Yamamoto  
*Science* **2000**, 290(5494), 1140–1142. DOI: 10.1126/science.290.5494.1140 (Nov. 10)
- (2) “Enantioselective halocyclization of polyprenoids induced by nucleophilic phosphoramidites”  
 Akira Sakakura, Atsushi Ukai, Kazuaki Ishihara  
*Nature* **2007**, 455(7130), 900–903. DOI: 10.1038/nature05553 (Feb. 22)
- (3) “Quaternary ammonium (hypo)iodite catalysis for enantioselective oxidative cycloetherification”  
 Muhammet Uyanik, Hiroaki Okamoto, Takeshi Yasui, Kazuaki Ishihara  
*Science* **2010**, 328(5984), 1376–1379. DOI: 10.1126/science.1188217 (Jun. 11)
- (4) “High-turnover hypiodite catalysis for asymmetric synthesis of tocopherols”  
 Muhammet Uyanik, Hiroki Hayashi, Kazuaki Ishihara  
*Science* **2014**, 345(6194), 291–294. DOI: 10.1126/science.1254976 (July 18).
- (5) “Chemoselective oxidative generation of *ortho*-quinone methides and tandem transformations”  
 Muhammet Uyanik, Kohei Nishioka, Ryutaro Kondo, Kazuaki Ishihara\*  
*Nat. Chem.* **2020**, 12(4), 353–362.
- (6) “Hypiodite-catalyzed oxidative umpolung of indoles for enantioselective dearomatization”  
 Hiroki Tanaka, Naoya Ukegawa, Muhammet Uyanik,\* Kazuaki Ishihara\*

*J. Am. Chem. Soc.* **2022**, *144*(13), 5756–5761.

(7) “Highly enantioselective radical cation [2+2] and [4+2] cycloadditions by chiral iron(III) photoredox catalysis”

Shuhei Ohmura, Kei Katagiri, Haruna Kato, Takahiro Horibe, Sho Miyakawa, Jun-ya Hasegawa, Kazuaki Ishihara\*

*J. Am. Chem. Soc.* **2023**, *145*(28), 15054–15060.

(8) “Chiral macrocyclic catalysts for the enantioselective addition of lithium acetylides to ketones”

Kenji Yamashita, Yuji Tabata, Katsuya Yamakawa, Takuya Mochizuki, Kai Matsui, Manabu Hatano,\* Kazuaki Ishihara\*

*J. Am. Chem. Soc.* **2023**, *145*, ASAP.

(9) “Tandem isomerization/ $\alpha,\beta$ -site-selective and enantioselective addition reactions of *N*-(3-butynoyl)-3,5-dimethylpyrazole induced by chiral  $\pi$ -Cu(II) catalysts”

Weiwei Guo, Masahiro Hori, Yoshihiro Ogura, Kazuki Nishimura, Kosuke Oki, Tomoyuki Ikai, Eiji Yashima, Kazuaki Ishihara\*

*J. Am. Chem. Soc.* **2023**, ASAP. OPEN ACCESS

Publication Date: November 30, 2023

### Book

(1) *Acid Catalysis in Modern Organic Synthesis*, Vols. 1, 2, Hisashi Yamamoto, Kazuaki Ishihara Eds.; Wiley-VCH Verlag, GmbH & Co. KGaA, Weinheim, 2008.

(2) *Iodine Catalysis in Organic Synthesis*, Kazuaki Ishihara, Kilian Muñiz, Wiley-VCH: Weinheim, 2022 (432 pages), ISBN 9783527348299