Masamichi Nishihara

PERSONAL INFORMATION

Affiliation: Professor
International Research Center for Hydrogen Energy
Kyushu University

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Phone: +81-92-802-6741

Degree: Doctor of Engineering
Language ability: Japanese (Mother tongue), English (fluent)

H-index: 18

PROFESSIONAL EXPERIENCE

Oct. 2022 – : **International Research Center for Hydrogen energy, Kyushu University, JAPAN,**
https://researchmap.jp/m.nishihara?lang=en

Professor

Research topic:
• Clarification of suppression mechanism of polymer electrolyte membranes used in PEFCs and water electrolyzers by low oxygen permeation
• Improvement of catalyst activity in PEFCs by high oxygen permeable polymer electrolyte materials
• Chemical surface modification on metal oxide catalyst supports by low molecular weight electrolyte materials
• Self-healing polymer electrolyte membranes
• Life-time and performance estimation of polymer electrolyte membranes using physical models of membrane degradation, ionic diffusion and catalyst reactions in PEFCs.

April. 2022 – Sept. 2022 : **Toyota Central R&D Labs, JAPAN,**
https://www.tytlabs.co.jp

Researcher

Research topic:
• Development of a kinetics model on degradation mechanism of polymer electrolyte membrane used in fuel cell vehicles

Achievements:
• Contribution to improve the accuracy of simulation on membrane degradation used in PEFC for fuel cell vehicles.

Oct. 2016 – March 2022 : **Next-Generation Fuel Cell Research Center (NEXT-FC), Kyushu University, JAPAN,**
http://www.mech.kyushu-u.ac.jp/~hup/

Associate Professor

Address: 225, Next-FC, 744 Motooka, Nishi-ku, Fukuoka-shi,
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Director and leader: Prof. Kazunari Sasaki
The target of this center is to realize next-generation fuel cells and the related technology. FWe are focusing on development of state-of-the-art fuel cell which is not only PEFC, but also SOFC.

Achievements:
· **Development of noble polymer electrolyte membranes (PEMs) for polymer electrolyte fuel cell application**
· Evaluation of the prepared PEMs by electrochemical analysis
· Development of non-Pt and durable electrode

Responsibilities:
· Development of the materials for next-generation fuel cell which can be operated at high temperature (~120˚C) and low humid condition (< 30 RH%)
· Management of a research group and supervision of master course thesis

April 2016 – Sept. 2016: **Center for Co-Evolutional Social Systems (CESS), Kyushu University, JAPAN,**
(http://coi.kyushu-u.ac.jp/en/)
Research Associate Professor, Energy unit
Address: 225, Next-FC, 744 Motooka, Nishi-ku, Fukuoka-shi,
Fukuoka, 819-0395, JAPAN
Telephone: +81-92-802-6811

Energy unit (Unit leader: Prof. Kazunari Sasaki)
Our goal is to popularize fuel cell technology and hydrogen energy system in general public. We are focusing on development of state-of-the-art and practical fuel cell which is not only PEFC, but also SOFC.

Achievements:
· Development of noble polymer electrolyte membranes (PEMs) for polymer electrolyte fuel cell application
· Evaluation of the prepared PEMs by electrochemical analysis
· Development of non-Pt and durable electrode

Responsibilities:
· Development of the materials for next-generation fuel cell which can be operated at high temperature (~120˚C) and low humid condition (< 30 RH%)
· Management of a research group and supervision of master course thesis

April 2011 – March 2016: **International Institute for Carbon-Neutral Energy Research, (WPI-I2CNER), Kyushu University, JAPAN,** (http://i2cner.kyushu-u.ac.jp/en/)
Assistant Professor, Electrochemical conversion division (Fuel Cells division until June 2015)

Fuel cell division (Division leader: Prof. Kazunari Sasaki)
Our team is consisting of international researchers in the different fields of research. We are focusing on development of state-of-the-art fuel cell which is not only PEFC,

but also SOFC.

Achievements:
· Development of noble polymer electrolyte membranes (PEMs) for polymer electrolyte fuel cell application
· Evaluation of the prepared PEMs by electrochemical analysis
· Development of non-Pt and durable electrode
· Had been awarded several competitive research grants totaling € 15 million from Japanese government by CT films (FY2011-2014)
· Analysis of molecular geometry of PEMs by theoretical calculation and spectroscopic experiments (Collaboration work)

Responsibilities:
· Development of the materials for next-generation fuel cell which can be operated at high temperature (~120˚C) and low humid condition (< 30 RH%)
· Management of a research group and supervision of master course thesis
· Lecture for undergraduate students in English

April 2009 – March 2011: **Institute for Materials Chemistry and Engineering, Kyushu University, JAPAN**
Research assistant professor

Prof. Atsushi Takahara group
His group focuses on physics of polymeric materials and development of functional polymers.

Achievements:
· Developed new polymeric materials with dynamic covalent bond
· Developed charge-transfer complex hybrid films (CT films)
· Understood polymer science widely through discussion and research with group members
· Obtained new synthesis techniques, especially controlled polymerization, and measurement skills (thermal gravimetory, mechanical strength measurement, X-ray Photoelectron Spectroscopy etc.)

Responsibilities:
· Promoted newly started project in the group as a group member
· Supervised students working on the research I proposed
· Advised group members about their research, supervised writing papers and preparation of presentation
· Taught group members about experimental techniques such as organic synthesis, polymerization, how to use equipment etc.

April 2005 – March 2009: **Kanagawa Academy of Science and Technology (KAST)**,
Nano-medical Polymers project, Kawasaki, Kanagawa, Japan
Researcher

Dr. Masayuki Yokoyama group
Task of this project was to develop polymeric drug carriers for cancer chemotherapy. To achieve this target, we developed polymeric micelles which are core-shell type polymeric particles with several tenth nanometer and biocompatible.

Achievements:
· Took a biomedical engineering course for 1 year at Tokyo Women's medical university, understood medical engineering
· Took a charge of 7 interdisciplinary collaboration projects with medical doctors, biologists and companies
· Gained experience to accomplish collaboration works smoothly with researchers in different fields of research

· Development of functional polymeric micelles for sensing
· Preparation of polymeric micelles loading novel anti-cancer drugs
· Development of stimuli-responsive polymeric micelles

Responsibilities:
· Design of drug carriers, evaluation of drug encapsulation and release
· Promoted collaboration works with medical doctors and biologists for evaluation and improvement of the prepared micelles

May 2003 – April 2005: **Department of Organic Chemistry, University of Geneva, Switzerland**
Postdoctoral fellow

Prof. Stefan Matile group
Matile group focused on various functions of peptides and their aggregates. The target of this group was to evaluate the mechanism of these functions and to reproduce these functions by artificial peptide supramolecular structures.

Achievements:
· Evaluation of arginine peptide translocation and enzyme sensing
· Gained experience of multi-step organic synthesis
· Gained English skill to pursue research in English
· Pentapeptide synthesis for artificial β-barrels

Responsibilities:
· Synthesis and analysis of surpramolecular materials
· Biosensing by using vesicles encapsulating fluorescence dye.

EDUCATION

Oct. 2005 – Sept. 2006: Biomedical curriculum, Tokyo Women's medical university.

April 2000 – March 2003: Graduate School of Science & Technology (Doctor course),
Supervisor: Prof. Hirotaka Ihara, Kumamoto University, Japan

April 1998 – March 2000: Graduate School of Science & Technology (Master course)
Kumamoto University, Japan

April 1994 – March 1998: Department of Applied Chemistry, Faculty of Engineering,
Kumamoto University, Japan

SKILLS AND INTERESTS

· Polymer synthesis, organic synthesis and characterization
· Polymer electrolytes membranes for PEFC and water electrolysis application
· Drug delivery system by using polymeric micelles

MAJOR

Polymer science (polymerization, polymer modification, polymer electrolytes, peptide, biomaterials), supramolecular chemistry,
Organic chemistry

Specialty

• **Polymer electrolyte fuel cell** (design of polymer electrolytes, evaluation of proton conductivity etc.)
• **Drug delivery system** (design of drug carriers, evaluation of drug encapsulation and release etc.)
• Functionalization of polymers and evaluation of their functions
• Fabrication of supramolecular structure by using various interactions such as hydrogen bonding, π-π interaction, hydrophobic interaction and charge-transfer interaction

Polymer synthesis by radical polymerization, condensation reaction and addition reaction

Preparation of functional graded materials (methcrylate-bromostyrene copolymer, Si-Ti glass)
Synthesis of amphiphilic block copolymers for drug carriers (addition, RAFT polymerization, ATRP)
Synthesis of sulfonated polyimide for polymer electrolyte membranes

Organic synthesis

Synthesis of monomers (methacrylate, acrylate, NCA etc.) and initiators (RAFT polymerization and ATRP)
Liquid-phase peptide synthesis
Multistep synthesis for formation of supramolecular compounds

Characterization of polymers and organic compounds

Spectroscopy (NMR, UV, fluorescence, IR, XRD etc.), chromatography, thermal analysis

Polymer electrolyte fuel cell

Design, synthesis and preparation of polymer electrolytes and its characterization
Evaluation of proton conductivity by electrochemical method

Functionalization of polymers and evaluation of its functionalities

Molecular design and synthesis of functional polymers
Characterization of functional polymers

Drug delivery system

Design, synthesis and preparation of drug carriers and its characterization
Evaluation of drug encapsulation and release

PUBLICATIONS

1. Y. A. Hutapea, M. Nishihara, Z. A. R. Gautama, A. Mufundirwa, S. M. Lyth, T. Sugiyama, M. Nagayam, K. Sasaki, A. Hayashi, “Reduction of oxygen transport resistance in PEFC cathode through blending a high oxygen permeable polymer”, ***J. Power Sources***, 2023, 556, 232500. https://doi.org/10.1016/j.jpowsour.2022.232500

2. M. Yasutake, Z. Noda, J. Matsuda, S. M. Lyth, M. Nishihara, K. Ito, A. Hayashi, K. Sasaki, “Ru-core Ir-shell electrocatalysts deposited on a surface-modified Ti-based porous transport layer for polymer electrolyte membrane water electrolysis”, ***Int. J. Hydrogen Energy***, in press.

3. E. M. Can, M. Nishihara, J. Matsuda, K. Sasaki, S. M. Lyth, “Tailored wettability in fluorinated carbon nanoparticles synthesized from fluorotelomer alcohols”, ***Applied Surface Science***, 2023, 626, 157136. https://doi.org/10.1016/j.apsusc.2023.157136

4. M. Vorokhta , M. I. M. Kusdhany, D. Voros, M. Nishihara, K. Sasaki, S. M. Lyth, “Microporous carbon foams: The effect of nitrogen-doping on CO2 capture and separation via pressure swing adsorption”, ***Chemical Engineering J.,*** 471 (2023) 144524.
https://doi.org/10.1016/j.cej.2023.144524

5. T. Takahashi, Y. Kokubo, K. Murata, O. Hotaka, S. Hasegawa, Y. Tachikawa, M. Nishihara, J. Matsuda, T. Kitahara, S. M. Lyth, A. Hayashi, K. Sasaki, “Cold start cycling durability of fuel cell stacks for commercial automotive applications”, ***Int. J. Hydrogen Energy***, 2022, 47, 41111-41123.
https://doi.org/10.1016/j.ijhydene.2022.09.172

6. E.M. Can, A. Mufundirwa, P. Wang, S. Iwasaki, T. Kitahara, H. Nakajima, M. Nishihara, K. Sasaki, S.M. Lyth, “Superhydrophobic fluorinated carbon powders for improved water management in hydrogen fuel cells”, ***J. Power Sources***, 2022, 548, 232098-232098.
https://doi.org/10.1016/j.jpowsour.2022.232098

7. Z. A. R. Gautama, Y. A. Hutapea, B. Hwang, J. Matsuda, A. Mufundirwa, T. Sugiyamaf, M. Ariyoshi, S. Fujikawa, S. M. Lyth, A. Hayashi, K. Sasaki and M. Nishihara, “Suppression of Radical Attack in Polymer Electrolyte Membranes using a Vinyl Polymer Blend Interlayer with Low Oxygen Permeability”, ***J. Membrane Science***, 2022, 658, 120734.
DOI: 10.1149/1945-7111/ac662d

8. T. Takahashi, T. Ikeda, K. Murata, O. Hotaka, S. Hasegawa, Y. Tachikawa, M. Nishihara, J. Matsuda, T. Kitahara, S. M. Lyth, A. Hayashi, and K. Sasaki, “Accelerated Durability Testing of Fuel Cell Stacks for Commercial Automotive Applications: A Case Study”, ***J. Electrochem. Soc.***, 2022, 169, 044523.
DOI: 10.1149/1945-7111/ac662d

9. S. Kitano , M. Nishihara , K. Kamitani , T. Sugiyama , S. Yoshioka , T. Miwa, K. Yoshizawa, A. Staykov, M. Yamauchi, “Heterointerface created on Au cluster-loaded unilamellar hydroxide electrocatalysts as a highly active site for the oxygen evolution reaction”, ***Advanced Materials***, 2022, 34, 2110552.
DOI: 10.1002/adma.202110552

10. B. Hwang, S. Kondo, T. Kikuchi, K. Sasaki, A. Hayashi, M. Nishihara, “Silicone-containing polymer blend electrolyte membranes for fuel cell applications”, ***J. Appl. Polym. Sci.***, 2021, 138, 18, 50328.
DOI: 10.1002/app.50328

11. S. Feng, S. Kondo, T. Kikuchi, L. Christiani, B. Hwang, K. Sasaki, M. Nishihara, “Development of a Heat-Treated PolymerPolymer Type Charge-Transfer Blend Membrane for Application in Polymer Electrolyte Fuel Cells”, ***ACS Applied Energy Materials***, 2019, 2, 8715−8723.
DOI: 10.1021/acsaem.9b01697

12. Y. Terayama, S. Furukawa, M. Nomura, T. Haji, M. Nishihara, O. Mendoza, Y. Sone, H. Matsumoto, “Preparation of hydrophobic electrocatalyst layer and inorganic porous electrolyte layer for water absorbing porous electrolyte electrolysis cell”, ***Int. J. Hydrogen Energy***, 2018, 43, 11903-11912.
doi.org/10.1016/j.ijhydene.2018.04.137

13. S. Feng, S. Kondo, T. Kaseyama, T. Nakazawa, T. Kikuchi, R. Selyanchyn, S. Fujikawa, L. Christiani, K. Sasaki, M. Nishihara, “Development of polymer-polymer type charge-transfer blend membranes for fuel cell application”, ***J. Membrane Science***, *2018*, 548, 223–231.
doi.org/10.1016/j.memsci.2017.11.025

14. S. Feng, S. Kondo, T. Kaseyama, T. Nakazawa, T. Kikuchi, R. Selyanchyn, S. Fujikawa, L. Christiani, K. Sasaki, M. Nishihara, “Characterization of polymer-polymer type charge-transfer (CT) blend membranes for fuel cell application”, ***Data in Brief***, 2018, 18, 22–29.
doi.org/10.1016/j.dib.2018.02.031

15. L. Christiani, K. Sasaki, M. Nishihara, “Aliphatic SPI Charge-transfer Complex Hybrid Films for High Temperature Polymer Electrolyte Membrane Fuel Cells”, ***J. Appl. Polym. Sci***., 2018, 13 (14), No. 46087.
DOI: 10.1002/APP.46087

16. Y. Terayama, S. Furukawa, M. Nomura, T. Haji, M. Nishihara, O. Mendoza, Y. Sone, H. Matsumoto, “Carbon Black / PTFE Composite Hydrophobic Gas Diffusion Layers for a Water-Absorbing Porous Electrolyte Electrolysis Cell”, ***Int. J. Hydrogen Energy***, 2018, 43, 2018-2025.
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17. M. Nishihara, Y. Terayama, T. Haji, S. M. Lyth, S. Satokawa, H. Matsumoto, “Proton-conductive nano zeolite-PVA composite film as a new water-absorbing electrolyte for water electrolysis”, ***eXPRESS Polymer Letters***, *2018*, 12, 3, 256–264.

18. K. Kitamura, H. Honda, S. Takaki, M. Nishihara, K. T. Christensen, Y. Mitani, “Experimental study of two-phase fluid flow in the porous sandstone by P-wave velocity and electrical impedance measurement”, ***Energy Procedia***, *2017*, 114, 4948 – 4953.
doi: 10.1016/j.egypro.2017.03.1636

19. M. Okumura, Z. Noda, J. Matsuda, M. Nishihara, S. M. Lyth, A. Hayashi, K. Sasaki, Correlating Cathode Microstructure with PEFC Performance Using FIB-SEM and TEM”, ***J. Electrochem. Soc***., *2017*, 164, 9, F928-F934.

20. S. Feng, K. Sasaki, M. Nishihara, “Effect of Sulfonation Level on Sulfonated Aromatic Poly (Ether Sulfone)Membranes as Polymer Electrolyte for High-Temperature Polymer Electrolyte Membrane Fuel Cells”, ***Macromolecular Chemistry and Physics***, *2016*, 217, 2692-2699.

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22. L. Christiani, K. Sasaki, M. Nishihara, “Development of Charge-Transfer Complex Hybrid Films as Polymer Electrolyte Membrane for High Temperature PEFC Operation”, ***Macromolecular Chemistry and Physics****, 2016,* 217*,* 654–663. DOI: 10.1002/macp.201500320

23. T. Bayer, B. V. Cunning, R. Selyanchyn, T. Daio, M. Nishihara, S. Fujikawa, K. Sasaki, S. M. Lyth, “Alkaline anion exchange membranes based on KOH-treated multilayer graphene oxide”, ***J. Membrane Science***, *2016*, 508, 51–61. https://doi.org/10.1016/j.memsci.2016.02.017

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25. K. Sasaki, S. Taniguchi, Y. Shiratori, A. Hayashi, T. Oshima, M. Nishihara, Y. Tachikawa, T. Daio, T. Kawabata, M. Fujita, A. Zaitsu, “Smart fuel cell demonstration project: A challenge to realize SOFC-powered campus“, ***ECS Transactions***, *2015*, 68 (1), 171-178.

26. K. Imato, M. Nishihara, A. Irie, A. Takahara, H, Otsuka, “Diarylbibenzofuranone-Based Dynamic Covalent Polymer Gels Prepared via Radical Polymerization and Subsequent Polymer Reaction”, ***Gel***., *2015*, *1*(1), 58-68.

27. K. Imato, A. Irie, T. Kosuge, T. Ohishi, M. Nishihara, A. Takahara, H, Otsuka, “Mechanophores with a Reversible Radical System and Freezing-Induced Mechanochemistry in Polymer Solutions and Gels”, ***Angewandte Chemie. Int. Ed.***, *2015*, 54, 21, 6168–6172.

28. L. Christiani, S. Hilaire, K. Sasaki, M. Nishihara, “Evaluation of proton conductivity of sulfonated polyimide/dihydroxy naphthalene charge-transfer complex hybrid membranes”, ***J. Poly. Sci., A, Polymer Chemistry***, *2014*, 52, 2991-2997.

29. T. Bayer, S. R. Bishop, M. Nishihara, K. Sasaki, S. M. Lyth, “Characterization of a Graphene Oxide Membrane Fuel Cell”, ***J. Power Sources***., *2014*, 272, 239-247.

30. K. Imato, T. Ohishi, M. Nishihara, A. Takahara, H. Otsuka “Network Reorganization of Dynamic Covalent Polymer Gels with Exchangeable Diarylbibenzofuranone at Ambient Temperature”, ***J. Am. Chem. Soc.,*** *2014*, 135, 33, 11839-11845.

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32. M. Nishihara, K. Imato, A. Irie, T. Kanehara, A. Kano, A. Maruyama, A. Takahara, H. Otsuka, “Reversibly Cross-linked Polymeric Micelles Formed by Autonomously Exchangeable Dynamic Covalent Bonds”, ***Chem. Lett.***, *2013*, 42, 377-379.

33. R. Watari, M. Nishihara, H. Tajiri, H. Otsuka, A. Takahara, “Preparation of novel polyimide hybrid materials by multi-layered charge-transfer complex formation”, ***Polymer Journal,*** *2013*, 45, 839-844.

34. K. Imato, M. Nishihara, T. Kanehara, Y. Amamoto, A. Takahara, H. Otsuka, "Self-Healing of Chemical Gels Cross-Linked by Diarylbibenzofuranone-Based Trigger-Free Dynamic Covalent Bonds at Room Temperature", ***Angewandte Chemie. Int. Ed***., *2011*, 50, 1 – 5.

35. K. Shiraishi, R. Endoh, H. Furuhata, M. Nishihara, R. Suzuki, K. Maruyama, Y. Oda, J. Jo, Y. Tabata, J. Yamamoto, M. Yokoyama, “A facile preparation method of a PFC-containing nano-sized emulsion for theranostics of solid tumors”, ***International Journal of Pharmaceutics***, *2011*, 379–387.

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38. T. Yano, W. O. Yah, H. Yamaguchi, Y. Terayama, M. Nishihara, M. Kobayashi, A. Takahara, “Preparation and surface characterization of surface-modified electrospun poly(methyl methacrylate) copolymer nanofibers”, ***Chem. Lett****., 2010*, 39, 1110-1111.

39. K. Hori, M. Nishihara, K. Shiraishi, M. Yokoyama, “The Combretastatin derivative (Cderiv), a vascular disrupting agent, enables polymeric nanomicelles to accumulate in microtumors”, ***J. Pharm, Sci.,*** *2010*, 99, 2914-2925.

40. K. Hori, M. Nishihara, M. Yokoyama, “Vital microscopic analysis of polymeric micelle extravasation from tumor vessels: macromolecular delivery according to tumor vascular growth stage”, ***J. Pharm, Sci.***, *2010*, 99, 549-562.

41. T. Mashimo, M. Ichikawa, E. Omurzak, M. Nishihara, H. Ihara, “Graded oxide glasses in binary systems (Si-Ti, Si-V, and Si-Zr) prepared by the sol-gel and centrifugal process”, ***Chem. Mater****., 2009*, 21, 2339-2343.

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43. T. Kawaguchi, T. Honda, M. Nishihara, T.Yamamoto, M. Yokoyama, “Histological study on side effects and tumor targeting of a block copolymer micelle on rats”, ***J. Control. Release***, *2009*, 136, 240-246.

44. T. Inoue, Y. Yamashita, M. Nishihara, S. Sugiyama, Y. Sonoda, T. Kumabe, M. Yokoyama, T. Tominaga, “Therapeutic efficacy of a polymeric micellar doxorubicin infused by convection-enhanced delivery against intracranial 9L brain tumor models, ***Neuro-Oncology***, *2009*, 11, 151-157.

45. M. Nishihara, Y. Murakami, T. Shinoda, J. Yamamoto, M. Yokoyama, “Synthesis and Characterization of a Temperature-responsive Amphiphilic Block Copolymer Containing a Liquid Crystalline Unit”, ***Chem. Lett***., *2008*, *37*, 1214-1215.

46. H. Koide, T. Asai, K. Hatanaka, T. Urakami, T. Ishii, E. Kenjo, M. Nishihara, M. Yokoyama, T. Ishida, H. Kiwada, N. Oku, “Particle size-dependent triggering of accelerated blood clearance phenomenon”, ***International J. of Pharmaceutics***, *2008*, *362*, 197-200.

47. H. Ihara, Y. Abe, A. Miyamoto, M. Nishihara, M. Takafuji, M. Ono, S. Okayasu, T. Mashimo, “Chemistry in Mega-gravity: Preparation of Molecular-scaled Graded Materials from Radical Copolymerization”, ***Chem. Lett.****, 2008*, *37*, 200-201.

48. T. Miyatake, M. Nishihara, S. Matile, “A Cost-Effective Method for the Optical Transduction of Chemical Reactions. Application to Hyaluronidase Inhibitor Screening with Polyarginine-Counteranion Complexes in Lipid Bilayers”, ***J. Am. Chem. Soc.***, *2006*, *128*, 12420-12421.

49. Y. Baudry, G. Bollot, V. Gorteau, S. Litvinchuk, J. Mareda, M. Nishihara, D. Pasini, F. Perret, D. Ronan, N. Sakai, M. R. Shah, A. Som, N. Sorde P. Talukdar, D.-H. Tran, S. Matile, “Molecular Recognition by Synthetic Multifunctional Pores in Practice: Are Structural Studies Really Helpful?”, ***Adv. Funct. Mater****. 2006, 16*, 169-179.

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Books, reviews (Partially Japanese)

1. 西原正通、“固体高分子形燃料電池用電解質膜の技術開発の現状”, 材料の科学と工業, 日本材料科学会誌, vol. 58, No. 1, pp. 2–5, 2021. (2021. 2. 20)
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Awards

1. IPC2014 Young Scientist Poster Award
The 10th SPSJ International Polymer Conference (IPC2014), 2014.12.2-12.5
International Congress center "EPOCAL TSUKUBA"
L.Christiani, K.Sasaki, M.Nishihara
"Development of Modified Sulfonated Polyimide Charge-Transfer Film for High Temperature Polymer Electrolyte Fuel Cell Application"

2. Poster Award
8th ECNP International Conference on Nanostructured Polymers and Nanocomposites 2014.9.16-9.19, presentation: 2014.9.18 (Thu)
Technische Universität Dresden, Germany
Masamichi Nishihara, Liana Christiani, Kazunari Sasaki
"Post-modification of Polyamide by Charge-Transfer Complex Formation"

Invited lectures (Partially Japanese)

1. 西原正通, "酸素輸送に注目した新しい高分子電解質材料設計と膜劣化抑制、出力向上に関する評価", 水素・燃料電池材料研究会 (高分子学会), 上智大学, 2023. 1. 11.

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11. “New molecular design of hydrocarbon polymer electrolytes for PEFC application -charge-transfer complex hybrid films-“, FiMPART17, July 10-12, 2017, Bordeaux convention centre, Bordeaux, France.

12. ” Simple functionalization of polymeric materials by charge-transfer interaction -Method and fuel cell application-“, GREEN 2016, Dec 23-25, 2016, GIS Taipei Tech Convention Center, Taipei, Taiwan.

13. “水素エネルギー社会の実現に向けた九州大学の取り組み”, 日本OR学会オリンピック・パラリンピック特設部会研究会, エネルギーグループ, JRJP博多ビル, 2016年11月28日

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