

Curriculum Vitae



Yoh MATSUKI

Associate Professor

at Institute for Protein Research, The University of Osaka (formerly Osaka University)

at Center for Quantum Information and Quantum Biology, The University of Osaka

Nationality: Japanese
Birth year: 1975
E-mail: yoh@protein.osaka-u.ac.jp
yoh.matsuki.protein@osaka-u.ac.jp
Website: <http://www.protein.osaka-u.ac.jp/biophys/index.html>

Work Experience

2018- Osaka University, Associate Professor - [DNP for intracellular structural biology](#)
2009-2018 Osaka University, Assistant Professor - [High- \$B_0\$ MAS DNP Instruments](#)
2006-2009 Massachusetts Institute of Technology, Post-Doc in Prof. Robert G. Griffin Lab - [DNP MAS NMR Instruments and Biradicals](#)
2006-2009 Brandeis University, Post-Doc in Prof. Judith Herzfeld Lab - [NUS data processing methods](#)
2003-2006 Osaka University, Post-Doc in Prof. Hideo Akutsu Lab - [Software for automatic signal assignment and conformation determination](#)

Education

2003 Osaka University, Graduate School of Science, PhD in Science - [Symmetry dipolar recoupling methods for precise internuclear distance measurements](#)
2000 Chuo University, Graduate School of Science and Technology, BS in Applied Chemistry - [Solution NMR structure of cisplatin-bound oligomeric DNA](#)
1998 Chuo University, School of Science and Technology, BA in Applied Chemistry - [Synthesis and characterization of anti-tumor platinum complexes](#)

Contribution to Magnetic Resonance Community

Meeting Organization:

2025/12: Mechanisms of Amyloid Diseases, [Domestic](#), Osaka University

2025/9:	Advances in NMR Methodologies and Applications to Complex Biological Systems/Landscapes , Domestic , Biophysical Society Meeting Japan
2025/6:	Synuclein Aggregation and Diseases , International , Osaka University
2025/3:	Indo-Japan NMR Workshop , International , ICGEB Delhi, India
2024/12:	Toward Establishing LLPS Research Systems , International , Osaka University
2024/3:	Common Grounds of LLPS , Domestic , Zoom
2023/7:	How Structural Polymorphs Define Toxicity of Amyloid Fibrils? , International , Japanese Society of Neuropathology, Kobe, Japan
2017/8:	Future of Hyper-Polarized Nuclear Spins , International , Osaka University

Scientific Committee:

2025	Bid Committee , for 29 th ISMAR, Kyoto Meeting
2025	Program Committee , 24 th ENC-ISMAR, Asilomar Meeting
2020-	Executive Committee , The NMR Society of Japan
2015-	Council , The NMR Society of Japan
2017	Program Committee , 22 nd ISMAR-APNMR-NMRSJ-SEST, Osaka Meeting

Other Contributions

2024-	External Evaluation Committee , Research Center for Development of Far-Infrared Region, Fukui University
2023-	Guest Chief Editor , Biophysical Chemistry, Elsevier
2019-	Cooperating Scientist , Japan Atomic Energy Agency (JAEA)
2011-	Reviewer of 15 international scientific journals , J. Phys. Chem. Letters, Angew. Chem., J. Chem. Phys., JACS Au, Comm. Biol., Chem. Comm., etc.
2010-	Science lecturer for high-school students , 1 - 3 times every year

Teaching Experiences

Courses:	Advanced Biological Science (Graduate School of Science) Biomolecular Dynamics Analysis (Graduate School of Science) Advanced Experimental Chemistry (Graduate School of Science) Basic Protein Science (Graduate School of Science) Chemical Bonding Theory (for first-year students) Scientific Research 101 (for first-year students)
Supervision:	15 MSc theses (Students from Japan, India , Sudan , Thailand , and China) 7 PhD theses (Students from Japan, India , Thailand , and China)

Major Research Grants

2020–2024	ASTEP (JST): Authentic Program (~1.2m USD)
2023–2026	KEKENHI (JSPS): Grant in Aid Scientific Research B (~134k USD)
2020–2023	KEKENHI (JSPS): Grant in Aid Scientific Research B (~128k USD)
2017–2019	KEKENHI (JSPS): Grant in Aid Scientific Research B (~109k USD)
2014–2017	KEKENHI (JSPS): Young Scientist A (~75k USD)

Awards

2018:	Young Scientist Award , The Nuclear Magnetic Resonance Society of Japan
2015:	Most Downloaded Paper Award Q3 , Journal of Magnetic Resonance (Elsevier)
2012:	Presidential Awards , Osaka University
2010:	Very Important Paper Award , Angewandte Chemie (Wiley-VCH)

Patents

Biradical:	US9035054 B2,	PCT/JP2022/031633	
Closed-cycle helium MAS:	JP6471518,	US 10,254,357 B2	
Gas purging system:	JP7433612,	US11,914,009B2,	EP4134691
MAS rotor:	JP6750819,	US10,914,799 B2,	EP3 561 532 B1
DNP probe:	JP6823305,	US10,955,489 B2,	EP3629046
	JP6823304,	US11,061,088 B2,	EP3 617 728 B1

International Invited Talks

2025/12	Pacificchem, Honolulu, HI, USA
2025/7	EUROMAR, Oulu, Finland
2025/3	Indo-Japan NMR Workshop, Delhi, India
2024/8	ICMRBS, Seoul, Korea
2023/9	International Hyperpolarization Conference, Leipzig, Germany
2023/9	FGMR Annual Discussion Meeting on Magnetic Resonance, Konstanz, Germany
2023/9	Alpine Conference on Magnetic Resonance in Solids, Chamonix, France
2023/8	ISMAR, Brisbane, Australia
2023/7	Telluride Science and Research Center Workshop, Telluride, CO, USA
2023/3	Molecular Basis of Proteinopathies (Univ. of Michigan, Zoominar Series), Zoom
2023/2	3rd Indo-Japan NMR workshop, Hokkaido, Japan
2021/12	Pacificchem, Zoom
2021/8	ISMAR, Zoom
2020/7	Massachusetts Institute of Technology Seminar Series on Solid-State NMR, Zoom

2020/2	Ulm Meeting on Biophysics of Amyloid Formation, Ulm, Germany
2020/1	The 14th International Symposium of the Institute Network for Biomedical Sciences, Osaka University, Japan
2019/12	2nd Indo-Japanese Bilateral Meeting on Magnetic Resonance, Hyderabad, India
2019/8	EUROISMAR, Berlin, Germany
2019/8	Telluride Science and Research Center Workshop, Telluride, CO, USA
2019/3	Japan-Korea Bilateral Symposium on Multi-Scale Structural Life Science and Advanced Technologies, Japan
2019/1	The 1st Asian-European International Exchange Symposium in Solid-State NMR, RIKEN-Yokohama, Japan
2018/9	APES-IES, Brisbane, Australia
2018/9	Spin Physics, Chemistry and Technology Meeting, Novosibirsk, Russia
2018/5	BigMag Meeting, University of California Santa Barbara, CA, USA
2017/11	Institute for Chemical Research International Symposium '17 DNP-NMR Workshop, Kyoto University, Japan
2017/7	10th International Workshop on Strong Microwaves and Terahertz Waves, Nizhny-Novgorod, Russia
2017/6	AWEST International Workshop on Electron Spin Science and Technology, Hyogo, Japan
2017/3	The 6th International Workshop on Far-Infrared Technologies, Fukui University, Japan
2016/6	The Second Trilateral Workshop for Frontier Protein Studies, Osaka University, Japan
2015/12	Pacificchem, HI, USA
2015/11	The 19th Osaka City University International Workshop on Advanced Molecular Materials Science – Spin Relaxation and Applications–, Osaka City University, Japan
2015/4	ENC, Asilomar, CA, USA
2014/11	APES-IES-SEST, Nara, Japan
2013/11	7th Japanese-Russian International Workshop on Open-Shell Compounds and Molecular Spin Devices, Hyogo, Japan
2013/3	5th International Workshop on Far-Infrared Technologies, Fukui, Japan
2011/9	3rd International DNP Symposium, EPFL, Lausanne, Switzerland

Papers

37. F. Hobo, Y. Tanimoto, Y. Endo, [Y. Matsuki](#) and H. Takahashi, 400 MHz/263 GHz ultra-low temperature MAS-DNP using a closed-cycle helium gas cooling system and a solid-state microwave source, [J. Magn. Reson.](#) 373, 107842 (2025)
36. Z. Zhang, K. Kato, H. Tamaki and [Y. Matsuki](#), Background signal suppression by opposite polarity subtraction for targeted DNP NMR spectroscopy on mixture samples, [Phys. Chem. Chem. Phys.](#)

26, 9880 (2024)

35. H. Tamaki and [Y. Matsuki](#), Optimal-control-based $C\beta$ chemical shift encoding for efficient assignment of solid proteins, [J. Phys. Chem. B](#) 127, 10118-10128 (2023)
34. F. A. Perras, [Y. Matsuki](#), S. A. Southern, T. Dubroca, D. F. Flesariu, J. Van Tol, C. P. Constantinides, P. A. Koutentis, Mechanistic origins of methyl-driven Overhauser DNP, [J. Chem. Phys.](#) 158, 154201 (2023)
33. M. Takamuku, T. Sugishita, H. Tamaki, L. Dong, M. So, T. Fujiwara, [Y. Matsuki](#), Evolution of α -synuclein conformation ensemble toward amyloid fibril via liquid-liquid phase separation (LLPS) as investigated by dynamic nuclear polarization-enhanced solid-state MAS NMR, [Neurochem. Int.](#) 157, 105345- (2022)
32. [Y. Matsuki](#), S. Nakamura, Y. Endo, H. Takahashi, H. Suematsu, T. Fujiwara, Cryogenic signal amplification combined with helium-temperature MAS DNP toward ultimate NMR sensitivity at high field conditions, [J. Magn. Reson.](#) 335, 107139 (2022)
31. [Y. Matsuki](#), T. Kobayashi, J. Fukazawa, F. A. Perras, M. Pruski, T. Fujiwara, Efficiency analysis of helium-cooled MAS DNP: case studies of surface-modified nanoparticles and homogeneous small-molecule solutions, [Phys. Chem. Chem. Phys.](#) 23, 4919- (2021)
30. [Y. Matsuki](#), T. Sugishita, T. Fujiwara, Surface-Only Spectroscopy for Diffusion-Limited Systems Using Ultra-Low Temperature DNP MAS NMR at 16.4 T, [J. Phys. Chem. C](#) 124, 18609-18614 (2020)
29. T. Kanda, M. Kitawaki, T. Arata, [Y. Matsuki](#) and T. Fujiwara, Structural analysis of cross-linked poly(vinyl alcohol) using high-field DNP-NMR, [RSC Adv.](#) 10, 8039-8043 (2020)
28. [Y. Matsuki](#) and T. Fujiwara, Cryogenic Platforms and Optimized DNP Sensitivity, [eMagRes](#) 7, 9–24 (2018)
27. T. Sugishita, [Y. Matsuki](#) and T. Fujiwara, Absolute ^1H polarization measurement with a spin-correlated component of magnetization by hyperpolarized MAS-DNP solid-state NMR, [Solid State NMR](#) 99, 20-26 (2019)
26. E. M. Khutoryan, T. Idehara, A. N. Kuleshov, Y. Tatematsu, Y. Yamaguchi, [Y. Matsuki](#), and T. Fujiwara, Simultaneous Stabilization of Gyrotron Frequency and Power by PID Double Feedback Control on the Acceleration and Anode Voltages, [J. Infrared Milli. Terahz. Waves](#) 38, 813-823 (2017)
25. T. Idehara, E. M. Khutoryan, I. Ogawa, [Y. Matsuki](#), and T. Fujiwara, Modulation and Stabilization of the Output Power and Frequency of FU Series Gyrotrons, [Int. J. Terahz. Sci. Tech](#) 9, 117-130 (2016)
24. K. Ueda, [Y. Matsuki](#), T. Fujiwara, Y. Tatematsu, I. Ogawa, T. Idehara, Further Characterization of 394-GHz Gyrotron FU-CW GII with Additional PID Control System for 600-MHz-DNP-SSNMR Spectroscopy, [J. Infrared Milli. Terahz. Waves](#) 37, 825-836 (2016)
23. [Y. Matsuki](#), T. Idehara., J. Fukazawa and T. Fujiwara, Advanced Instrumentation for DNP-Enhanced MAS NMR for Higher Magnetic Fields and Lower Temperatures, [J. Magn. Reson.](#) 264, 107-115 (2016)
22. [Y. Matsuki](#), S. Nakamura., S. Fukui, H. Suematsu, and T. Fujiwara, Closed-Cycle Cold Helium

- Magic-Angle Spinning for Sensitivity-Enhanced Multi-Dimensional Solid-State NMR, *J. Magn. Reson.* 259, 76-81 (2015)
21. T. Idehara, E. M. Khutoryan, Y. Tatematsu, Y. Yamaguchi, A. N. Kuleshov, O. Dumbrajs, *Y. Matsuki* and T. Fujiwara, High-Speed Frequency Modulation of a 460 GHz Gyrotron for Enhancement of 700 MHz DNP-NMR Spectroscopy, *J. Infrared Millim. Terahz. Waves* 36, 819-829 (2015)
 20. T. Idehara, Y. Tatematsu, Y. Yamaguchi, E. M. Khutoryan, A. N. Kuleshov, K. Ueda, *Y. Matsuki* and T. Fujiwara, The Development of 460 GHz Gyrotrons for 700 MHz DNP-NMR Spectroscopy, *J. Infrared Millim. Terahz. Waves* 36, 613-627 (2015)
 19. R. Ikeda, Y. Yamaguchi, Y. Tatematsu, T. Idehara, I. Ogawa, T. Saito, *Y. Matsuki* and T. Fujiwara, Broadband Continuously Tunable Gyrotron for 600 MHz DNP-NMR Spectroscopy, *Plasma Fusion Res* 9, 1206058 (2014)
 18. *Y. Matsuki*, K. Ueda, T. Idehara, R. Ikeda, I. Ogawa, S. Nakamura, M. Toda, T. Anai, and T. Fujiwara, Helium-Cooling and -Spinning Dynamic Nuclear Polarization for Sensitivity-Enhanced NMR at 14T and 30K, *J. Magn. Reson.* 225, 1-9 (2012)
 17. T. Idehara, J. C. Mudiganti, L. Agus, T. Kanemaki, I. Ogawa, T. Fujiwara, *Y. Matsuki* and K. Ueda, Development of a Compact sub-THz Gyrotron FU CW CI for Application to High Power THz Technologies, *J. Infrared Millim. Terahz. Waves* 33, 724-744 (2012)
 16. *Y. Matsuki*, K. Ueda, T. Idehara, R. Ikeda, K. Kosuga, I. Ogawa, S. Nakamura, M. Toda, T. Anai, and T. Fujiwara, Application of Continuously Frequency-Tunable 0.4 THz Gyrotron to Dynamic Nuclear Polarization for 600 MHz Solid-State NMR, *J. Infrared Millim. Terahz. Waves* 33, 745-755 (2012)
 15. *Y. Matsuki*, T. Konuma, T. Fujiwara, and K. Sugase, Boosting Protein Dynamics Studies Using Quantitative Non-Uniform Sampling NMR Spectroscopy, *J. Phys. Chem. B* 115, 13740-13745 (2011)
 14. J. Herzfeld, D. Rand, *Y. Matsuki*, E. Daviso, M. Mak-Jurkauskas, and I. Mamajanov, Molecular Structure of Humin and Melanoidin via Solid State NMR, *J. Phys. Chem. B* 115, 5741-5745 (2011)
 13. E. A. Nanni, A. B. Barnes, *Y. Matsuki*, P. P. Woskov, B. Corzilius, R. G. Griffin, and R. J. Temkin, Microwave Field Distribution in a Magic Angle Spinning Dynamic Nuclear Polarization NMR Probe, *J. Magn. Reson.* 210, 16-23 (2011)
 12. *Y. Matsuki*, M. T. Eddy, R. G. Griffin, and J. Herzfeld, Rapid 3D MAS NMR Spectroscopy at Critical Sensitivity, *Angew. Chem. Int. Ed.* 49, 9215-9218 (2010)
 11. A. B. Barnes, B. Corsilius, M. L. Mak-Jurkauskas, L. B. Andreas, V. S. Bajaj, *Y. Matsuki*, M. L. Belenky, J. Lugtenburg, J. R. Sirigiri, R. J. Temkin, J. Herzfeld and R. G. Griffin, Resolution and Polarization Distribution in Cryogenic DNP/MAS Experiments, *Phys. Chem. Chem. Phys.* 12, 5861-5867 (2010)
 10. *Y. Matsuki*, H. Takahashi, K. Ueda, T. Idehara, I. Ogawa, M. Toda, H. Akutsu and T. Fujiwara, Dynamic Nuclear Polarization Experiments at 14.1T for Solid-State NMR, *Phys. Chem. Chem. Phys.* 12, 5799-5803 (2010)

9. T. Idehara, K. Kosuga, L. Agusu, R. Ikeda, I. Ogawa, T. Saito, [Y. Matsuki](#), K. Ueda, and T. Fujiwara, Continuously Frequency Tunable High Power Sub-THz Radiation Source—Gyrotron FUCW VI for 600 MHz DNP-NMR Spectroscopy, [J. Infrared Milli. Terahz. Waves](#) 31, 775-790 (2010)
8. A. B. Barnes, M. L. Mak-Jurkauskas, [Y. Matsuki](#), V. S. Bajaj, P. C.A. van der Wel, R. DeRocher, J. Bryant, J. R. Sirigiri, R. J. Temkin, J. Lugtenburg, J. Herzfeld, and R. G. Griffin, Cryogenic Sample Exchange NMR Probe for Magic Angle Spinning Dynamic Nuclear Polarization, [J. Magn. Reson.](#) 198, 261-270 (2009)
7. [Y. Matsuki](#), T. Maly, O. Ouari, H. Karoui, F. Le Moigne, E. Rizzato, S. Lyubenova, J. Herzfeld, T. Prisner, P. Tordo, and R. G. Griffin, Dynamic Nuclear Polarization with a Rigid Biradical, [Angew. Chem. Int. Ed.](#) 48, 4996-5000 (2009)
6. [Y. Matsuki](#), M. T. Eddy, and J. Herzfeld, Spectroscopy by Integration of Frequency and Time Domain Information for Fast Acquisition of High-Resolution Dark Spectra, [J. Am. Chem. Soc.](#) 131, 4648-4656 (2009)
5. [Y. Matsuki](#), H. Akutsu, and T. Fujiwara, Spectral Fitting for Signal Assignment and Structural Analysis of Uniformly ^{13}C -Labeled Solid Proteins by Simulated Annealing based on Chemical Shifts and Spin Dynamics, [J. Biomol. NMR](#) 38, 325-339 (2007)
4. M. Kobayashi, [Y. Matsuki](#), I. Yumen, T. Fujiwara, and H. Akutsu, Signal Assignment and Secondary Structure Analysis of a Uniformly [^{13}C , ^{15}N]-Labeled Membrane Protein, H⁺-ATP Synthase Subunit c, by Magic-Angle Spinning Solid-State NMR, [J. Biomol. NMR](#) 36, 279-293 (2006)
3. K. Iwata, T. Fujiwara, [Y. Matsuki](#), H. Akutsu, S. Takahashi, H. Naiki, and Y. Goto, 3D Structure of Amyloid Protofilaments of β 2-Microglobulin Fragment Probed by Solid-State NMR, [Proc. Natl. Acad. Sci. U.S.A.](#) 103, 18119-18124 (2006)
2. [Y. Matsuki](#), H. Akutsu, T. Fujiwara, Precision 1H-1H Distance Measurement via ^{13}C NMR Signals: Utilization of ^1H - ^1H Double-Quantum Dipolar Interactions Recoupled under Magic Angle Spinning Conditions, [Magn. Reson. Chem.](#) 42, 291 – 300 (2004)
1. [Y. Matsuki](#), H. Akutsu, and T. Fujiwara, Band-Selective Recoupling of Homonuclear Double-Quantum Dipolar Interaction with a Generalized Composite 0-Degree Pulse: Application to ^{13}C Aliphatic Region-Selective Magnetization Transfer in Solids, [J. Magn. Reson.](#) 162, 54-66 (2003)

Books and Reviews

6. [Y. Matsuki](#) and T. Fujiwara, [Experimental approaches of NMR spectroscopy](#) -Methodology and application to life science and materials science- Chapter 5: Advances in high field DNP methods, Edited by A. Naito, Springer, ISBN: 978-981-10-5966-7 (2018); 2nd Edition = ISBN: 978-981-97-6829-5 (2025)
5. M. So, H. Tamaki, [Y. Matsuki](#), Recent high-resolution studies of cross-beta structures, [The Cell](#) 56, 17- (2024)
4. [Y. Matsuki](#) and T. Fujiwara, [High-Frequency Dynamic Nuclear Polarization NMR](#), Chapter 5:

Cryogenic Platforms and Optimized DNP Sensitivity, Edited by R. G. Griffin et al., Wiley and Sons, ISBN: 978-1-119-44164-9 (2020)

3. [Y. Matsuki](#), T. Fujiwara, High-field DNP using closed-cycle helium MAS system, [JEOL News](#) 54, 46-52 (2019)
2. [Y. Matsuki](#), Closed-cycle helium MAS DNP-NMR probe and its application, [Bulletin Nucl. Magn. Reson. Soc. Jap.](#) 6, 85-88 (2015)
1. [Y. Matsuki](#), Sensitivity enhancement by ultra-low temperature DNP at high-field, [Proc. Soc. Solid-State NMR Mater.](#) 56, 1-6 (2014)