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| 若い男性の顔  自動的に生成された説明**Hideshi Ooka**  **RIKEN Center for Sustainable Resource Science（CSRS）**  **Biofunctional Catalyst Research Team  Research Scientist** |

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| Online Profile | |
| E-mail： | hideshi.ooka@riken.jp |
| Google Scholar： | <https://scholar.google.com/citations?user=tEC744kAAAAJ&hl=ja> |
|  | Total Citations：1887（As of Aug. 20, 2024） |
|  | h-index：16 （As of Aug. 20, 2024） |
| Japanese Research ID: | 90825994 |
| ORCID: | <https://orcid.org/0000-0002-6921-6796> |
| Lab HP： | <http://rnakamura-lab.riken.jp/> |
| Personal HP： | <https://hideshiooka.com> |

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| Education |

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| 2006/4/1 – 2009/3/31 | High School Attached to Osaka Kyoiku University |
| 2009/4/1 – 2013/3/31 | University of Tokyo, Applied Chemistry (Bachelor) |
| 2013/4/1 – 2015/3/31 | University of Tokyo, Applied Chemistry（Master） |
| 2015/4/1 – 2018/3/31 | University of Tokyo, Applied Chemistry（PhD） |

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| **Professional Experience** |

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| 2018/4/1 – 2019/3/31 | RIKEN Postdoctoral Researcher “Oxygen Evolution Catalysis using Earth-Abundant Materials” |
| 2019/4/1 – 2020/9/31 | RIKEN Special Postdoctoral Researcher “Unraveling Catalytic Mechanisms using In-Situ Spectroscopy” |
| 2020/10 – present | RIKEN Research Scientist (Permanent) Development of Nonequilibrium Catalyst Theory |

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| Awards |

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| 2024/4/16 | RIKEN CSRS Incentive Award |
| 2021/1/18 | Best Special Postdoctoral Researcher Award |
| 2020/3/25 | RIKEN Oubu Award for Young Researchers |
| 2019/4/1 | RIKEN Special Postdoctoral Researcher |
| 2018/10/19 | Invited to JSPS SPD Interview |
| 2018/3/21 | University of Tokyo, Applied Chemistry Cum Laude |
| 2018/3/21 | University of Tokyo, MERIT Program Cum Laude |
| 2015/4/1 | JSPS DC1 Scholarship |
| 2013/10/21 | CSJ Chemistry Festival Poster Prize |

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| **Academic Publications (All Peer Reviewed)** |

**Original Papers: 24**

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| 1. | Yoko Chiba\*+, **Hideshi Ooka**\*+, Marie E. Wintzer, Nao Tsunematsu, Takehiro Suzuki, Naoshi Dohmae, Ryuhei Nakamura "Diverse Phosphoserine Phosphatases Exhibit Maximum Activity at an Intermediate Binding Affinity in Accord With the Sabatier Principle of Catalysis " ***Angew. Chem. Int. Ed.***, **2024**, *63*, e202318635. |

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| 2. | Shuang Kong, Ailong Li\*, Jun Long, Kiyohiro Adachi, Daisuke Hashizume, Qike Jiang, Kazuna Fushimi, **Hideshi Ooka**, Jianping Xiao\*, Ryuhei Nakamura\* "Acid-Stable Manganese Oxides for Proton Exchange Membrane Water Electrolysis " ***Nat. Catal.***, **2024**, *7*, 252-261. |

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| 3. | Ailong Li\*, Shuang Kong, Kiyohiro Adachi, **Hideshi Ooka**, Kazuna Fushimi, Qike Jiang, Hironori Ofuchi, Satoru Hamamoto, Masaki Oura, Kotaro Higashi, Takuma Kaneko, Tomoya Uruga, Naomi Kawamura, Daisuke Hashizume, Ryuhei Nakamura\* "Atomically Dispersed Hexavalent Iridium Oxide From MnO2 Reduction for Oxygen Evolution Catalysis " ***Science***, **2024**, *384*, 666-670. |

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| 4. | Hye-Eun Lee, Tomoyo Okumura, **Hideshi Ooka**, Kiyohiro Adachi, Takaaki Hikima, Kunio Hirata, Yoshiaki Kawano, Hiroaki Matsuura, Masaki Yamamoto, Masahiro Yamamoto, Akira Yamaguchi, Ji-Eun Lee, Ki Tae Nam, Daisuke Hashizume, Shawn McGlynn, Ryuhei Nakamura "Osmotic Energy Conversion in Deep-Sea Hydrothermal Vents " ***Nat. Commun.***, **2024**, (*Accepted at Nat. Commun.*). |

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| 5. | Koichi Yatsuzuka, Kiyohiro Adachi, Daisuke Hashizume, Ryuhei Nakamura\*, **Hideshi Ooka**\* "A Non-Rate-Determining Redox Process Dictates the Oxygen Evolution Tafel Slope of MnO2 " ***J. Phys. Chem. C***, **2023**, *127*, 22457-22463. |

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| 6. | **Hideshi Ooka**\*, Yoko Chiba, Ryuhei Nakamura "Thermodynamic Principle to Enhance Enzymatic Activity Using the Substrate Affinity " ***Nat. Commun.***, **2023**, *141*, 4860. |

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| 7. | **Hideshi Ooka**\*, Marie E. Wintzer, Hirokazu Komatsu, Kiyohiro Adachi, Ailong Li, Shuang Kong, Daisuke Hashizume, Atsushi Mochizuki, Ryuhei Nakamura\* "Dissipation Lifetime of Catalysis as a Dynamical System " ***ChemRxiv***, **2023**, (*Under review at JPCL*). |

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| 8. | Ailong Li, Shuang Kong, Chenxi Guo, **Hideshi Ooka**, Kiyohiro Adachi, Daisuke Hashizume, Qike Jiang, Hongxian Han, Jianping Xiao\*, Ryuhei Nakamura\* "Enhancing the Stability of Cobalt Spinel Oxide Towards Sustainable Oxygen Evolution in Acid " ***Nat. Catal.***, **2022**, *5*, 109-118. |

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| 9. | Daoping He\*, **Hideshi Ooka**, Yamei Li, Yujeong Kim, Akira Yamaguchi, Kiyohiro Adachi, Daisuke Hashizume, Naohiro Yoshida, Sakae Toyoda, Sun Hee Kim, Ryuhei Nakamura\* "Regulation of the Electrocatalytic Nitrogen Cycle Based on Sequential Proton-Electron Transfer " ***Nat. Catal.***, **2022**, *5*, 798-806. |

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| 10. | Ji-Eun Lee, Akira Yamaguchi, **Hideshi Ooka**, Tomohiro Kazami, Masahiro Miyauchi, Norio Kitadai, Ryuhei Nakamura\* "In Situ FTIR Study of CO2 Reduction on Inorganic Analogues of Carbon Monoxide Dehydrogenase " ***Chem. Commun.***, **2021**, *57*, 3267-3270. |

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| 11. | **Hideshi Ooka**\*, Marie E. Wintzer, Ryuhei Nakamura "Non-Zero Binding Enhances Kinetics of Catalysis: Machine Learning Analysis on the Experimental Hydrogen Binding Energy of Platinum " ***ACS Catal.***, **2021**, *11*, 6298-6303. |

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| 12. | Daoping He, **Hideshi Ooka**, Yujeong Kim, Yamei Li, Fangming Jin\*, Sun Hee Kim\*, Ryuhei Nakamura\* "Atomic-Scale Evidence for Highly Selective Electrocatalytic N- N Coupling on Metallic MoS2 " ***Proc. Natl. Acad. Sci.***, **2020**, *117*, 31631-31638. |

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| 13. | Yamei Li\*, Yoo Kyung Go, **Hideshi Ooka**, Daoping He, Fangming Jin, Sun Hee Kim\*, Ryuhei Nakamura\* "Enzyme Mimetic Active Intermediates for Nitrate Reduction in Neutral Aqueous Media " ***Angew. Chem. Int. Ed.***, **2020**, *59*, 9744-9750. |

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| 14. | Daoping He, **Hideshi Ooka**, Yamei Li, Fangming Jin\*, Ryuhei Nakamura\* "Phase-Selective Hydrothermal Synthesis of Metallic MoS2 at High Temperature " ***Chem. Lett.***, **2019**, *58*, 5054-5058. |

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| 15. | Ailong Li, **Hideshi Ooka**, Nadege Bonnet, Toru Hayashi, Yimeng Sun, Qike Jiang, Can Li, Hongxian Han\*, Ryuhei Nakamura\* "Stable Potential Windows for Long-Term Electrocatalysis by Manganese Oxides Under Acidic Conditions " ***Angew. Chem. Int. Ed.***, **2019**, *58*, 5054-5058. |

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| 16. | **Hideshi Ooka**\*, Ryuhei Nakamura "Shift of the Optimum Binding Energy at Higher Rates of Catalysis " ***J. Phys. Chem. Lett.***, **2019**, *10*, 6706-6713. |

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| 17. | Daoping He, Yamei Li, **Hideshi Ooka**, Yoo Kyung Go, Fangming Jin\*, Sun Hee Kim\*, Ryuhei Nakamura\* "Selective Electrocatalytic Reduction of Nitrite to Dinitrogen Based on Decoupled Proton-Electron Transfer " ***J. Am. Chem. Soc.***, **2018**, *140*, 2012-2015. |

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| 18. | Hirotaka Kakizaki, **Hideshi Ooka**, Toru Hayashi, Akira Yamaguchi, Nadege Bonnet-Mercier, Kazuhito Hashimoto, Ryuhei Nakamura\* "Evidence That Crystal Facet Orientation Dictates Oxygen Evolution Intermediates on Rutile Manganese Oxide " ***Adv. Funct. Mater.***, **2018**, *28*, 1706319. |

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| 19. | **Hideshi Ooka**, Kazuhito Hashimoto, Ryuhei Nakamura\* "Design Strategy of Multi-Electron Transfer Catalysts Based on a Bioinformatic Analysis of Oxygen Evolution and Reduction Enzymes " ***Mol. Inform.***, **2018**, *37*, 1700139. |

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| 20. | **Hideshi Ooka**, Akira Yamaguchi, Toshihiro Takashima, Kazuhito Hashimoto, Ryuhei Nakamura\* "Efficiency of Oxygen Evolution on Iridium Oxide Determined From the pH Dependence of Charge Accumulation " ***J. Phys. Chem. C***, **2017**, *121*, 17873-17881. |

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| 21. | **Hideshi Ooka**, Toshihiro Takashima, Akira Yamaguchi, Toru Hayashi, Ryuhei Nakamura\* "Element Strategy of Oxygen Evolution Electrocatalysis Based on in Situ Spectroelectrochemistry " ***Chem. Commun.***, **2017**, *53*, 7149-7161. |

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| 22. | **Hideshi Ooka**, Marta C. Figueiredo, Marc T. M. Koper\* "Competition Between Hydrogen Evolution and Carbon Dioxide Reduction on Copper Electrodes in Mildly Acidic Media " ***Langmuir***, **2017**, *33*, 9307-9313. |

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| 23. | **Hideshi Ooka**, Yuanqing Wang, Akira Yamaguchi, Makoto Hatakeyama, Shinichiro Nakamura, Kazuhito Hashimoto\*, Ryuhei Nakamura\* "Legitimate Intermediates of Oxygen Evolution on Iridium Oxide Revealed by in Situ Electrochemical Evanescent Wave Spectroscopy " ***Phys. Chem. Chem. Phys.***, **2016**, *18*, 15199-15204. |

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| 24. | **Hideshi Ooka**, Takumi Ishii, Kazuhito Hashimoto\*, Ryuhei Nakamura\* "Light-Induced Cell Aggregation of Euglena Gracilis Towards Economically Feasible Biofuel Production " ***RSC Adv.***, **2014**, *4*, 20693-20698. |

**Reviews: 3**

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| 1. | Thomas Kadyk\*, Jianping Xiao, **Hideshi Ooka**, Jun Huang, Kai S. Exner\* "Material and Composition Screening Approaches in Electrocatalysis and Battery Research " ***Front. Energ. Res.***, **2021**, *9*, 227. |

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| 2. | **Hideshi Ooka**\*, Jun Huang, Kai S. Exner "The Sabatier Principle in Electrocatalysis: Basics, Limitations, and Extensions " ***Front. Energ. Res.***, **2021**, *9*, 155. |

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| 3. | **Hideshi Ooka**, Shawn E. McGlynn, Ryuhei Nakamura\* "Electrochemistry at Deep-Sea Hydrothermal Vents: Utilization of the Thermodynamic Driving Force Towards the Autotrophic Origin of Life " ***ChemElectroChem***, **2019**, *6*, 1316-1323. |

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| **Presentations (Japanese Titles were Translated to English)** |

**Invited Presentations (13)**

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| 1. | **Hideshi Ooka** "TBA " Data Science Seminar, Meiji University, Tokyo (2024/09/02). |

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| 2. | **Hideshi Ooka** "Dynamical Systems Analysis of Catalysis using Experiments, Mathematics, and Machine Learning " MIMS/CMMA Seminar on Self-Organization, Meiji University, Tokyo (2024/06/27). |

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| 3. | **Hideshi Ooka** "Acquiring Skills Toward Uncovering the Laws of Nature " RIKEN Discovery Evening, RIKEN, Wako (2024/02/13). |

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| 4. | **Hideshi Ooka** "Research is Fun! Wait, is studying fun too!? " Lecture as a Senior, Fuzoku Ikeda Junior High School, Osaka (2023/09/16). |

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| 5. | **Hideshi Ooka** "Kinetic Modeling of Enzymes and Electrocatalysts " 2023 Workshop on Bidirectional Catalysis From Molecular Machines to Enzymes, Paris, France (2023/09/11). |

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| 6. | **Hideshi Ooka** "Development of Catalyst Theory and the Joys of Research from the Perspective of a Experimentalist Turned Theoretician " MERIT-WINGS Seminar Camp, Lector Yugawara, Hakone (2023/08/06). |

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| 7. | **Hideshi Ooka** "Analysis and Experimental Verification of Dissipative Chemical Reaction Networks Towards Understanding Sustainability " Math-Experimental Collaboration Towards an Overall Understanding of Catalysis, Enzymes, and the Ecosystem, RIKEN, Wako (2023/03/09). |

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| 8. | **Hideshi Ooka** "Using Machine Learning in Catalysis Theory " Seminar # 212203, Technical Information Institute Seminar, Online (2022/12/08). |

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| 9. | **Hideshi Ooka** "Green Hydrogen Production via Water Electrolysis: Challenges and Prospects " Public Lecture, City Hall, Wako (2021/12/07). |

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| 10. | **Hideshi Ooka**, Ryuhei Nakamura "From Thermodynamics to Kinetics: Predicting New Catalysts By Revisiting the Sabatier Principle " 8th ELSI Symposium "Extending Views of Catalysis", Tokyo Institute of Technology, Japan (2020/02/03). **Keynote speaker on Early Career Researcher's Day** |

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| 11. | **Hideshi Ooka**, Ryuhei Nakamura "Shift of the Optimum Binding Energy at Higher Rates of Catalysis " The 4th Solar Fuel Material Workshop, Seoul National University, Korea (2019/09/27). |

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| 12. | **Hideshi Ooka** "Study on Electrocatalysis based on Informatics and Electron Transfer Theory " The 4th Catalyst Informatics Symposium, Iino Hall, Tokyo (2018/11/21). |

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| 13. | **Hideshi Ooka** "Element Strategy of Multi-Electron Transfer Catalysis: Lessons from the Oxygen Evolution Strategies of Iridium Oxide and Photosystem II " Seminar at Nam Lab, Seoul National University, Korea (2018/06/05). |

**Oral Presentations (26)**

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| 1. | **Hideshi Ooka** "Kinetic Requirements to Sustain Chemical Reaction Networks in an Open System " Japan Geoscience Union Meeting 2023, Makuhari Messe, Tokyo (2024/05/26). |

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| 2. | Taiyo Tamura, **Hideshi Ooka**, Kosuke Fujishima "Bioinformatic Analysis on the Relationship between the Binding Affinity and Catalytic Activity of Enzymes " Japan Society for Bioscience, Biotechnology, and Agroscience 2024 Annual Meeting, Tokyo University of Agriculture, Tokyo (2024/03/26). |

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| 3. | **Hideshi Ooka**, Ryuhei Nakamura "Towards a Post-Sabatier Theory of Electrocatalysis: Realizing Activity and Stability " The 104th CSJ Annual Meeting, Nihon University, Funabashi (2024/03/21). |

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| 4. | **Hideshi Ooka**, Ryuhei Nakamura "Advancements of Electrocatalysis Theory towards Realizing Activity and Stability " The 91st ECSJ Annual Meeting, Nagoya University, Nagoya (2024/03/16). |

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| 5. | **Hideshi Ooka**, Marie E. Wintzer, Ryuhei Nakamura "Predicting the Operational Lifetime of Electrocatalysis " 74th Annual Meeting of the International Society of Electrochemistry, Lyon, France (2023/09/08). |

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| 6. | **Hideshi Ooka**, Marie E. Wintzer, Hirokazu Komatsu, Kiyohiro Adachi, Ailong Li, Shuang Kong, Daisuke Hashizume, Atsushi Mochizuki, Ryuhei Nakamura "Predicting the Lifetime of Dissipative Chemical Reaction Networks " 2023 Annual Meeting of the Japanese Society for Mathematical Biology, Nara Womens University, Nara (2023/09/04). |

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| 7. | **Hideshi Ooka**, Yoko Chiba, Ryuhei Nakamura "Mathematical Theory to Maximize Enzymatic Activity Under Thermodynamic Constraints " 10th International Congress on Industrial and Applied Mathematics, Waseda University, Tokyo (2023/08/20). |

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| 8. | **Hideshi Ooka** "Theoretical Advancements towards Predicting the Activity and Stability of Electrocatalysts using Microkinetics and Applied Mathematics " Seminar at Koper Lab, Leiden University, The Netherlands (2023/06/21). |

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| 9. | **Hideshi Ooka** "Theoretical Requirements for Active and Stable Anode Materials " Magneto Special Anodes, Schiedam, The Netherlands (2023/06/20). |

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| 10. | **Hideshi Ooka** "Rationalizing the Influence of the Overpotential on the Activity and Stability of Electrocatalysts " Seminar at Exner Lab, University of Duisberg-Essen, Germany (2023/06/16). |

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| 11. | **Hideshi Ooka** "Predicting the Autocatalytic Feedback for a General Chemical Reaction Network " Japan Geoscience Union Meeting 2023, Makuhari Messe, Tokyo (2023/05/21). |

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| 12. | **Hideshi Ooka**, Yoko Chiba, Ryuhei Nakamura "Binding Affinity to Maximize Enzymatic Activity " Electrochemical Society of Japan 90th Annual Meeting, Tohoku Institute of Technology, Sendai (2023/03/27). |

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| 13. | **Hideshi Ooka** "Introduction as an Experimentalist Turned Theoretician " Lab-Theory Standing Talk, RIKEN, Wako (2023/03/16). **First seminar organized by iTHEMS to promote collaboration between experiments and theory.** |

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| 14. | **Hideshi Ooka** "Towards Quantitative Predictions of Chemical Reaction Networks " CO World Kickoff Meeting, Tokyo Institute of Technology, Earth-Life Science Institute, Tokyo (2023/01/16). |

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| 15. | **Hideshi Ooka** "Balancing Thermodynamics and Kinetics to Achieve Maximum Rates in Catalysis " iTHEMS Weekly Meeting, RIKEN, Wako (2020/01/17). |

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| 16. | **Hideshi Ooka**, Ryuhei Nakamura "Difference in the Binding Energy Which Optimizes the Rates and Overpotentials of Electrocatalysis " 3rd International Solar Fuels Conference-Young, Hiroshima, Japan (2019/11/19). |

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| 17. | **Hideshi Ooka**, Ryuhei Nakamura "Catalyst Design Based on the Binding Energy " Electrochemical Society of Japan Autumn Meeting, Yamanashi University, Kofu (2019/09/05). |

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| 18. | **Hideshi Ooka**, Ryuhei Nakamura "Element Strategy of Oxygen Evolution Electrocatalysis Based on the Reaction Mechanism of Manganese Oxide, Iron Oxide, and Iridium Oxide " 2019 North American Catalysis Society Meeting, Chicago, USA (2019/06/23). |

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| 19. | **Hideshi Ooka**, Ryuhei Nakamura "Development Strategies of Oxygen Evolution Catalysts Based on the Reaction Kinetics of Iridium Oxide and Manganese Oxide " The 3rd Solar Fuel Material Workshop, Osaka University, Japan (2018/03/13). |

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| 20. | **Hideshi Ooka**, Ryuhei Nakamura "From the d-band Model to Beyond: Development Strategies for Kinetically-Favorable Multi-Electron Transfer Catalysts " The 3rd Solar Fuel Material Forum, Osaka University, Japan (2018/03/12). |

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| 21. | **Hideshi Ooka**, Kazuhito Hashimoto, Ryuhei Nakamura "Element Strategy of Multi-Electron Transfer Catalysis: Difference Between 3d and 5d Metals based on the Operando Spectroscopy of Mn, Fe, and Ir based Oxygen Evolution Catalysts " Electrochemical Society of Japan Autumn Meeting, Nagasaki University, Nagasaki (2017/09/10). |

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| 22. | **Hideshi Ooka** 「Bioenergetic Restrictions on the Gene Structures of Photosynthetic and Respiratory　Enzymes 」 RIKEN CSRS Interim Report, RIKEN, Japan (2015/11/26). |

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| 23. | **Hideshi Ooka**, Akira Yamaguchi, Kazuhito Hashimoto, Ryuhei Nakamura "Detection of Oxygen Evolution Intermediates Using In situ Optical Waveguide Spectroscopy " Electrochemical Society of Japan 82nd Annual Meeting, Yokohama National University, Yokohama (2015/03/15). |

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| 24. | **Hideshi Ooka**, Akira Yamaguchi, Kazuhito Hashimoto, Ryuhei Nakamura "Detection of Oxygen Evolution Intermedates of Iridium Oxide Using Optical Waveguide Spectroscopy " 3rd Meeting of Solid and Surface Photochemistry, Kyoto University, Kyoto (2014/12/16). |

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| 25. | **Hideshi Ooka**, Akira Yamaguchi, Kazuhito Hashimoto, Ryuhei Nakamura "Element Strategy of Water Splitting: Difference between Mn and Ir " Electrochemical Society of Japan 81st Annual Meeting, Kansai University, Suita (2014/03/29). |

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| 26. | **Hideshi Ooka**, Takumi Ishii, Ryuhei Nakamura, Kazuhito Hashimoto "Wavelength Dependence of Euglena Photomotility " Japan Society for Bioscience, Biotechnology, and Agrochemistry Annual Meeting, Tohoku University, Sendai (2013/03/24). |

**Poster Presentations (23)**

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| 1. | Tamura Taiyo, **Hideshi Ooka**, Kosuke Fujishima "Bioinformatic Analysis on the Relationship Between the Rate Constant and Substrate Binding Affinity of Enzymes " 3rd Meeting of the Molecular Life Reactions FOREST Society, Okinawa Institute of Science and Technology, Okinawa (2024/06/17). |

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| 2. | **Hideshi Ooka** "Understanding Enzymatic Activity and Reversibility Using Microkinetic Models " 3rd Meeting of the Molecular Life Reactions FOREST Society, Okinawa Institute of Science and Technology, Okinawa (2024/06/17). |

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| 3. | Tomoharu Suda, **Hideshi Ooka**, Ryuhei Nakamura "Chemical Reaction Networks from a Non-autonomous Viewpoint " The 12th ELSI Symposium, Tokyo Institute of Technology, Earth-Life Science Institute, Tokyo (2024/01/09). |

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| 4. | Taiyo Tamura, **Hideshi Ooka**, Kosuke Fujishima "Bioinformatic Assessment on the Linear Scaling Relationship between the Binding Affinity and the Rate Constant of Enzymes " The 12th ELSI Symposium, Tokyo Institute of Technology, Earth-Life Science Institute, Tokyo (2024/01/09). |

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| 5. | **Hideshi Ooka** "Autocatalytic Threshold to Sustain Chemical Reaction Networks in the Presence of Diffusion " The 12th ELSI Symposium, Tokyo Institute of Technology, Earth-Life Science Institute, Tokyo (2024/01/09). |

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| 6. | **Hideshi Ooka**, Marie E. Wintzer, Hirokazu Komatsu, Kiyohiro Adachi, Ailong Li, Shuang Kong, Daisuke Hashizume, Atsushi Mochizuki, Ryuhei Nakamura "Theory towards Predicting the Lifetime of Electrocatalysis " MRM2023, Kyoto International Conference Center, Kyoto (2023/12/16). |

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| 7. | **Hideshi Ooka** "Development of Non-Equilibrium Catalytic Network Theory " FOREST-ARIM Joint Meeting, Osaka University, Osaka (2023/03/07). |

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| 8. | **Hideshi Ooka**, Yoko Chiba, Ryuhei Nakamura "Optimum Km to Maximize Enzymatic Activity " 1st Meeting of the Molecular Life Reactions FOREST Society, Kanazawa University, Kanazawa (2023/02/27). |

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| 9. | **Hideshi Ooka**, Ryuhei Nakamura "Difference in the Binding Energy Which Optimizes the Rates and Overpotentials of Electrocatalysis " 3rd International Solar Fuels Conference/International Conference on Artificial Photosynthesis 2019 (Joint symposium), Hiroshima, Japan (2019/11/20). |

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| 10. | **Hideshi Ooka**, Ryuhei Nakamura "Understanding Catalytic Efficiency based on the Topology of the Reaction Network " RIKEN CSRS Interim Report, RIKEN, Japan (2019/11/06). |

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| 11. | **Hideshi Ooka** "Spectral Analysis Using Machine Learning for Advanced Catalysis Development " The 5th CSRS-ITbM Joint Workshop, Nagoya University, Nagoya (2019/01/24). |

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| 12. | **Hideshi Ooka**, Ryuhei Nakamura "Element Strategy of Oxygen Evolution Catalysis Based on the Reaction Mechanism of Iridium Oxide " The 6th International Symposium on Solar Fuels and Solar Cells, Dalian, China (2018/10/12). |

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| 13. | **Hideshi Ooka**, Ryuhei Nakamura "Informatics Approach for Understanding Multi-Electron Transfer Regulation " Engineering Network Retreat 2018, Nihonbashi Life Science Hub, Tokyo (2018/02/28). |

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| 14. | **Hideshi Ooka**, Ryuhei Nakamura "Bioinformatics Approach for Understanding Biological Electron Transfer " RIKEN CSRS Interim Report, RIKEN, Japan (2017/11/01). |

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| 15. | **Hideshi Ooka**, Ryuhei Nakamura "Asymmetry of Oxygen Evolution and Oxygen Reduction Catalysts Revealed by a Bioinformatic Analysis of Enzymatic Genes " The 2nd Solar Fuel Material Workshop, Seoul National University, Korea (2017/02/23). |

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| 16. | **Hideshi Ooka**, Ryuhei Nakamura "Probing the Optimization Criteria of Biological Catalysts based on In-Silico Genetic Analysis of Phylogenetically Diverse Enzymes " The 3rd CSRS-ITbM Joint Workshop, Nagoya University, Nagoya (2017/01/12). |

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| 17. | **Hideshi Ooka**, Marc Koper, Ryuhei Nakamura "Differentiating Between Thermodynamic and Kinetic Rate Determining Processes for Multi-Electron Transfer Catalysis Beyond Computational Simulations " RIKEN CSRS Interim Report, RIKEN, Japan (2016/11/02). |

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| 18. | **Hideshi Ooka**, Marc Koper "Competition of Carbon Dioxide Reduction and Hydrogen Evolution on Copper Electrodes " 67th Annual Meeting of the International Electrochemical Society, Den Haag, The Netherlands (2016/08/21). |

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| 19. | **Hideshi Ooka**, Marc Koper "Competition of Carbon Dioxide Reduction and Hydrogen Evolution on Copper Electrodes " CINF Summer School 2016, Gilleleje, Denmark (2016/08/07). |

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| 20. | **Hideshi Ooka**, Kazuhito Hashimoto, Ryuhei Nakamura "The Asymmetry of Multi-Electron Transfer Processes at the Enzyme Gene Structure Level " 3rd International Workshop on Microbial Life under Extreme Energy Limitation, Sandbjerg Manor, Denmark (2015/09/21). |

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| 21. | **Hideshi Ooka**, Akira Yamaguchi, Kazuhito Hashimoto, Ryuhei Nakamura "Evaluation of the Charge Accumulation Process During the Oxygen Evolution Reaction on Iridium Oxide " 21st Symposium "Advances in Photocatalysis", University of Tokyo, Tokyo (2014/12/12). |

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| 22. | **Hideshi Ooka**, Akira Yamaguchi, Kazuhito Hashimoto, Ryuhei Nakamura "Charge Accumulation During Oxygen Evolution Catalysis on Iridium Oxide and Manganese Oxide " International Conference on Artificial Photosynthesis (ICARP2014), Awajishima, Japan (2014/11/24). |

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| 23. | **Hideshi Ooka**, Takumi Ishii, Ryuhei Nakamura, Kazuhito Hashimoto "Study on Euglena Photomotility towards Microbial Biofuel Production " The 3rd CSJ Chemistry Festa, Tower Hall Funabori, Tokyo (2013/10/21). |

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| **Patents** |

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| 1. | Kazuhito Hashimoto, Ryuhei Nakamura, **Hideshi Ooka**, Iwao Ueda, Hitoshi Matsuda "Method for concentrating microalga culture fluid and apparatus therefor " WO2014136574A1 (Public). |

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| 2. | Ryuhei Nakamura, **Hideshi Ooka**, Bonnet Nadege, Ailong Li, Shuang Kong, Hongxian Han "Water electrolysis method and equipment, and method for determining the driving potential of water electrolysis " JPWO2020032256A1 (Public). |

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| **Awards (Japanese Titles were Translated to English)** |

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| 1. | **Incentive Award**, RIKEN CSRS (2024/04/16). **Achievement based on advancing the theory of enzyme kinetics in the 2023 Nat. Commun. paper.** |

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| 2. | **Best SPDR Report**, RIKEN (2021/01/18). |

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| 3. | **Ohbu Award for Young Researchers**, RIKEN (2020/03/25). |

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| 4. | **Special Postdoctoral Researcher**, RIKEN (2019/04/01). |

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| 5. | **Invitation to SPD Interview**, Japan Society for the Promotion of Science (2018/10/19). **Interview declined to accept RIKEN SPDR position** |

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| 6. | **Cum Laude**, University of Tokyo, School of Engineering (2018/03/21). |

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| 7. | **Merit Award (4 awardees out of 40 candidates)**, University of Tokyo Leading Graduate Program MERIT (2018/03/07). |

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| 8. | **JSPS DC1 (no interview)**, Japan Society for the Promotion of Science (2015/04/01). |

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| 9. | **CSJ Chemistry Festa Poster Prize**, Chemical Society of Japan (2013/10/21). |

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| **Funding (Japanese Titles were Translated to English)** |

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| 1. | JST FOREST Program (Principal Investigator)  "Developing the Theory of Non-Equilibrium Catalytic Reaction Networks " (2022 April - 2029 March, 50,000,000 yen) |

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| 2. | JSPS Kakenhi Early Career (Principal Investigator)  "Predicting the Activity of Oxygen Evolution Electrocatalysts using Microkinetics and Machine Learning " (2022 April - 2024 March, 4,680,000 yen) |

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| 3. | JSPS Kakenhi Early Career (Principal Investigator)  "Introducing Low Spin Electron Configuration to Enhance the Activity of 3d-Block Oxygen Evolution Catalysts " (2020 April - 2022 March, 4,160,000 yen) |

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| 4. | RIKEN Cluster for Science, Technology, and Innovation Hub RIKEN and Tohoku University Joint Research Program (Principal Investigator)  "Using High Throughput DFT Calculations for Element Strategy of Catalysis " (2022 April - 2023 March, 1,730,000 yen) |

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| 5. | RIKEN Incentive Research Project (Principal Investigator)  "Study on the Charge Accumulation Process Towards the Rational Development of Earth-Abundant Oxygen Evolution Catalysts " (2018 April - 2020 March, 1,700,000 yen) |

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| 6. | RIKEN CSRS Next Generation Acceleration Research Program (Principal Investigator)  "Understanding Gene Regulation based on the Informational Value of mRNA-Protein Interactions " (2021 April - 2023 March, 2,000,000 yen) |

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| 7. | JSPS Kakenhi Transformative A (Co-Investigator)  "Chemistry: Demonstration of Prebiotic Metabolism in a CO-Rich Environment " (2022 April - 2027 March, 252,810,000 yen) |

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| 8. | JSPS Kakenhi A (Co-Investigator)  "Regulation of Catalytic Reaction Networks towards Realizing Stable Oxygen Evolution Catalysts " (2022 April - 2025 March, 30,350,000 yen) |