公開セミナー

主催:新潟大学 医療化学コア・ステ準備委員会

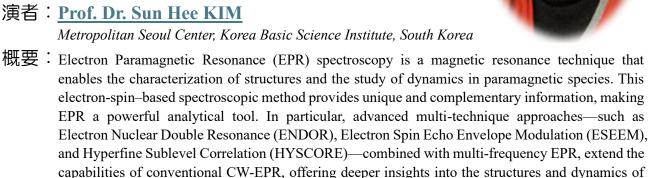
後援:(公)内田エネルギー科学振興財団

日時: 2025年11月19日13:00-14:00

場所:新潟大学 五十嵐キャンパス 物質生産棟 161

biologically and materially relevant paramagnetic systems.

演題: Applications of EPR Spectroscopy



The Advanced EPR Laboratory at KBSI is one of the largest EPR facilities in East Asia. Leveraging this powerful suite of spectroscopic tools, our research focuses on two main themes:

- Elucidating the effects of metal ions on amyloid-β peptide fibrillization relevant to Alzheimer's disease.
- Investigating biomimetic catalytic mechanisms—from well-defined molecular complexes to nanomaterials—that emulate nature's catalytic processes.

In this talk, I will introduce the principles and techniques of EPR spectroscopy and highlight several case studies demonstrating the applications of advanced EPR methods, with particular emphasis on recent results from our laboratory. [1-10]

- "Spectroscopic Capture of a Low-spin Mn(IV)-oxo Species in Ni-Mn₃O₄ Nanoparticles during Water Oxidation Catalysis". Nat. Commun, 2020.
- 2. "Enhanced Redox Reactivity of a Nonheme Iron(V)-Oxo Complex Binding Protons". J. Am. Chem. Soc. 2020, 142, 15305.
- "Enzyme Mimetic Active Intermediates for Nitrate Reduction in Neutral Aqueous Media". Angew. Chem. Int. Ed. 2020, 59, 2
- "Selective Electrocatalytic Reduction of Nitrite to Dinitrogen based on Decoupled Proton-Electron Transfer". J. Am. Chem. Soc. 2018, 140, 2012-2015.
- "Mechanistic Investigation of Water Oxidation Catalyzed by Uniform, Assembled MnO Nanoparticles". J. Am. Chem. Soc. 2017, 139, 2277-2285.
- "Mechanistic Insights into Tunable Metal-Mediated Hydrolysis of Amyloid-β Peptides". J. Am. Chem. Soc. 2017, 139, 2234-2244.
- "Synthesis and reactivity of a mononuclear non-haem cobalt(IV)-oxo complex". Nature Comm. 2017, 8, 14839.
- "Multi-frequency, Multi-technique Pulsed EPR Investigation of the Copper Binding Site of Murine Amyloid β Peptide". Angew. Chem. Int. Ed. 2015, 54, 1561-1564.
- "Pulsed ENDOR Characterization of Copper Coordination of an Amyloid β Peptide Relevant to Alzheimer's Disease". Angew. Chem. Int. Ed. 2013, 52, 1136-1142.
- 10. "Structural and Conformational Dynamics of Self-Assembling Bioactive β- Sheet Peptide Nanostructures Decorated with Multivalent RNA-binding Peptides". J. Am. Chem. Soc. 2012, 134, 16047-16053.

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