

## Woon Ju Song, Ph.D

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### **Professional Career**

Mar. 2022–Present	Associate Professor at Seoul National University, Seoul, Korea
Mar. 2016–Feb. 2022	Assistant Professor at Seoul National University, Seoul, Korea
Jul. 2011–Dec. 2015	Postdoctoral Scholar at University of California San Diego, CA (Professor F. Akif Tezcan)

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### **Education**

Ph.D. Chemistry Sep. 2006–Jun. 2011	Massachusetts Institute of Technology, MA (Professor Stephen J. Lippard)
M.S. Chemistry Sep. 2003–Aug. 2005	Ewha Womans University, Seoul, Korea (Professor Wonwoo Nam)
B.A. Chemistry/Science Education Mar. 2000–Sep. 2003	Ewha Womans University, Seoul, Korea

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### **Honors/Fellowship**

2022: Dae-Sill Lee Academic Excellence Prize for Young Researchers  
2020: ChemComm Emerging Investigator Lectureship  
2020: KCS-Wiley Young Chemist Award  
2019: Creative-pioneering Researchers Program, Seoul National University  
2018: Graeme Hanson-AsBIC Early Career Researcher Award  
2017–2018: Chung-am Science Fellowship (Junior Faculty), Posco TJ Park Foundation  
2007–2011: Research Assistant Fellowship at MIT  
2006–2007: Teaching Assistant Fellowship at MIT  
2005–2006: Research Internship from National Research Foundation of Korea  
2003–2004: Research Scholarship from Research Institute for Basic Sciences at Ewha Womans University  
*MAGNA CUM LAUDE*  
2000–2003: Dean's List, Honor Scholarship

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### **Professional Activities**

2022: Organizing Committee of Inorganic Chemistry in Korean Chemical Society  
2018–Present: Journal of Biological Inorganic Chemistry (JBIC) Member  
2018–2021: Organizing Committee of Korean Peptide and Protein Society  
2018, 2021: Organizing Committee of Life-Science Chemistry in Korean Chemical Society  
2011, 2016–Present: American Chemical Society (ACS) Member (Inorganic Chemistry, Life-Science Chemistry)  
2003–2005, 2016–Present: Korean Chemical Society (ACS) Member (Inorganic, Life-Science Chemistry)

## **Research Interests**

Design of Metalloproteins and Metalloenzymes; Re-directing the Enzymatic Activities of Metallo-enzymes and Engineering of Whole-Cell Catalysts; Directed Evolution of Protein-Based Catalysts and Biomaterials; Mechanistic, Structural, and Spectroscopic Studies of Natural and Artificial Enzymes; Discovery, Biochemical Characterization, and Engineering of Novel Enzymes and Proteins

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## **Teaching Experiences**

**Lectures:** Inorganic Chemistry II (3343.309-001, **2018** Fall; **2020** Fall; **2022** Fall), Advanced Chemistry (L0443.000100, **2018** Spring; **2019** Spring), Chemistry Seminar (3343.510, **2017** Fall), Advanced Inorganic Chemistry (3343.511, **2017** Spring, **2019** Fall, **2021** Fall), General Chemistry (034.020-002, **2016** Fall; **2017** Fall; **2018** Spring; **2020** Spring, **2022** Spring), Chemistry Colloquium (M1409.000200-001, **2016** Spring) at Seoul National University.

**TAs:** Course 5.32 (Intermediate chemistry experimentation, **2007** Spring), 5.310 (Undergraduate chemistry laboratory, **2006**, Fall) at Massachusetts Institute of Technology, Inorganic Chemistry (**2005** Fall) at Ewha Womans University

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## **Publications** (Independent Career; \*corresponding author)

**32.** Hwanjin Joo, Hyunuk Eom, Youna Cho, Mina Rho,\* **Woon Ju Song**\* “Discovery and Characterization of Polymyxin-Resistance Genes pmrE and pmrF from Sediment Microbiome” *Microbiol. Spectr.*, **2022**, *accepted*.

**31.** Woo Jae Jeong, **Woon Ju Song**,\* “Design and Directed Evolution of Noncanonical  $\beta$ -Stereoselective Metalloglycosidases” *Nat. Commun.*, **2022**, *13*, 6844.

**30.** Jaehee Lee,<sup>†</sup> Minwoo Yang,<sup>†</sup> **Woon Ju Song**\* “Chemical Expansion in the Design of Metalloproteins and Metalloenzymes with Noncanonical Amino Acids” **2022**, *Bull. Korean Chem. Soc.*, *ASAP*

**29.** Minwoo Yang, **Woon Ju Song**,\* “One-pot Two-step Synthesis of Micro- and Mesoporous Organic Fibrils for Efficient Pseudocapacitors” *J. Mater. Chem. A*, **2022**, *10*, 17511–17519.

**28.** Se-Min Jung, Minwoo Yang, **Woon Ju Song**\* “Symmetry-adapted Synthesis of Dicopper Oxidases with Divergent Dioxygen Reactivity” *Inorg. Chem.*, **2022**, *61*, 12433–12441.

**27.** Inseok Song, Younghyeon Kim, Jaeseung Yu, Su Yong Go, Hong Geun Lee, **Woon Ju Song**, Seokhee Kim\* “Molecular mechanism underlying substrate recognition of the peptide macrocyclase PsnB” *Nat. Chem. Biol.*, **2021**, *17*, 1123–1131.

**26.** Se-Min Jung,<sup>†</sup> Jaehee Lee,<sup>†</sup> **Woon Ju Song**,\* “Design of Artificial Metalloenzymes with Multiple Inorganic Elements: The More the Merrier”, *J. Inorg. Biochem.*, **2021**, *223*, 111552. <sup>†</sup>Contributed equally to this work.

**25.** Jaewon Lee, **Woon Ju Song**\* “Folding of Circularly Permuted and Split Outer Membrane Protein F via Electrostatic Interactions with Terminal Residues”, *Biochemistry*, **2021**, *60*, 1787–1796.

**24.** Jehyun Jeon,<sup>†</sup> Jaehee Lee,<sup>†</sup> Se-Min Jung, Jae Hong Shin, **Woon Ju Song**,\* and Mina Rho\* “Genomic Determinants Encode for the Reactivity and Regioselectivity of Flavin-Dependent Halogenases in Bacterial Genomes and Metagenomes”, **2021**, *mSystems*, *6*, e00053-21. <sup>†</sup>Contributed equally to this work.

**23.** Jaeseung Yu; Jinsol Yang, Chaok Seok, and **Woon Ju Song**\* “Symmetry-related Residues as Promising Hotspots for the Evolution of De Novo Oligomeric Enzymes”, *Chem. Sci.*, **2021**, *12*, 5091–5101 (Selected as the back cover and as a part of 2021 Chemical Science HOT Article Collection).

**22.** Woo Jae Jeong,<sup>†</sup> Jaeseung Yu,<sup>†</sup> and **Woon Ju Song**\* “Proteins as Effective, Diverse, and Evolvable Scaffolds for Metal-Dependent Biocatalysis”, *Chem. Comm.*, **2020**, *56*, 9586–9599. <sup>†</sup>Contributed equally to this work.

21. Mina Rho,\* **Woon Ju Song**,\* “Discovery of Novel Gene Functions by Chemistry-Guided Targeted Sequence Analysis” *Biochemistry*, **2020**, *59*, 10-11 (Invited in the “Future of Biochemistry” issue).

20. Minwoo Yang, **Woon Ju Song**\* “Diverse Protein Assembly Driven by Metal and Chelating Amino Acids with Selectivity and Tunability”, *Nat. Commun.*, **2019**, *10*, 5545.

19. Hyunuk Eom, **Woon Ju Song**\* “Emergence of Metal Selectivity and Promiscuity in Metalloenzymes” *J. Biol. Inorg. Chem.*, **2019**, *24*, 517-531.

18. Jae Hong Shin,<sup>†</sup> Hyunuk Eom,<sup>†</sup> **Woon Ju Song**,\* Mina Rho\* “Integrative Metagenomic and Biochemical Studies on Rifamycin ADP-ribosyltransferases Discovered in the Sediment Microbiome” *Sci. Rep*, **2018**, *8*, 12143

<sup>†</sup>Authors contributed equally to this work.

17. **Woon Ju Song**,\* Jaeseung Yu, and F. Akif Tezcan\* “Importance of Scaffold Flexibility/Rigidity in the Design and Directed Evolution of Artificial Metallo- $\beta$ -lactamases” *J. Am. Chem. Soc.* **2017**, *139*, 16772-16779.

#### - Prior to SNU

16. **Woon Ju Song**, F. Akif Tezcan “De Novo Design of an Artificial  $\beta$ -Lactamase Exhibiting *In Vitro* and *In Vivo* Catalysis” *Science*, **2014**, *346*, 1525-1528. This work was highlighted in *Nat. Chem.* **2015**, *7*, 277-279.

15. **Woon Ju Song**,<sup>†</sup> Pamela A. Sontz,<sup>†</sup> Xavier Ambroggio, F. Akif Tezcan “Metals in Protein-Protein Interfaces” *Annu. Rev. Biophys.*, **2014**, *43*, 409-431. <sup>†</sup>Authors contributed equally to this work.

14. Pamela A. Sontz,<sup>†</sup> **Woon Ju Song**,<sup>†</sup> F. Akif Tezcan “Interfacial Metal Coordination in Engineered Protein and Peptide Assemblies” *Curr. Opin. Chem. Biol.*, **2014**, *19*, 42-49. <sup>†</sup>Authors contributed equally to this work.

13. **Woon Ju Song**, Grant Gucinski, Matthew H. Sazinsky, Stephen J. Lippard “Tracking a Defined Route for O<sub>2</sub>-Migration in a Dioxygen-Activating Diiron Enzyme” *Proc. Natl. Acad. Sci.*, **2011**, *108*, 14795-14800.

12. **Woon Ju Song**, Stephen J. Lippard “Mechanistic Studies of Reactions of Peroxodi-iron(III) Intermediates in T201 Variants of Toluene/o-Xylene Monooxygenase Hydroxylase” *Biochemistry*, **2011**, *50*, 5391-5399.

11. Artem D. Bochevarov, Jianing Li, **Woon Ju Song**, Richard A. Friesner, Stephen J. Lippard “Insights into the Different Dioxygen Activation Pathways of Methane and Toluene Monooxygenase Hydroxylases” *J. Am. Chem. Soc.* **2011**, *133*, 7384-7397.

10. Christine E. Tinberg, **Woon Ju Song**, Viviana, Izzo, Stephen, J. Lippard “Multiple Roles of Component Proteins in Bacterial Multicomponent Monooxygenases: Phenol Hydroxylase and Toluene/o-Xylene Monooxygenase from *Pseudomonas sp.* OX1” *Biochemistry* **2011**, *50*, 1788-1798.

9. **Woon Ju Song**, Michael S. McCormick, Rachel K. Behan, Matthew H. Sazinsky, Wei Jiang, Jeffery Lin, Carsten Krebs, Stephen J. Lippard “Active Site Threonine Facilitates Proton Transfer during Dioxygen Activation at the Diiron Center of Toluene/o-Xylene Monooxygenase Hydroxylase” *J. Am. Chem. Soc.* **2010**, *132*, 13582-13585.

8. **Woon Ju Song**, Rachel K. Behan, Sunil G. Naik, Boi Hanh Huynh, Stephen J. Lippard “Characterization of a Peroxodiiron(III) Intermediate in the T201S Variant of Toluene/o-Xylene Monooxygenase Hydroxylase from *Pseudomonas sp.* OX1” *J. Am. Chem. Soc.* **2009**, *131*, 6074-6075.

7. Min-Jung Kang, **Woon Ju Song**, Ah-Rim Han, Young S. Choi, Ho G. Jang, Wonwoo Nam “Mechanistic Insight into the Aromatic Hydroxylation by High-Valent Iron(IV)-oxo Porphyrin  $\pi$ -Cation Radical Complexes” *J. Org. Chem.*, **2007**, *72*, 6301-6304.

6. **Woon Ju Song**, Mi Sook Seo, Serena DeBeer George, Takehiro Ohta, Rita Song, Min-Jung Kang, Takehiko Tosha, Teizo Kitagawa, Edward I. Solomon, Wonwoo Nam “Synthesis, Characterization, and Reactivities of Manganese(V)-Oxo Porphyrin Complexes” *J. Am. Chem. Soc.*, **2007**, *129*, 1268-1277.

**5. Woon Ju Song**, Ying Ji Sun, Sun Kyung Choi, Wonwoo Nam “Mechanistic Insights into the Reversible Formation of Iodosylarene–Iron Porphyrin Complexes in the Reactions of Oxoiron(IV) Porphyrin  $\pi$ -Cation Radicals and Iodoarenes: Equilibrium, Epoxidizing Intermediate, and Oxygen Exchange” *Chem. Eur. J.* **2005**, *12*, 130-137.

**4. Woon Ju Song**, Yon Ok Ryu, Rita Song, Wonwoo Nam “Oxoiron(IV) Porphyrin  $\pi$ -Cation Radical Complexes with a Chameleon Behavior in Cytochrome P450 Model Reactions” *J. Biol. Inorg. Chem.* **2005**, *10*, 294-304.

**3. Se-Eun Park**, **Woon Ju Song**, Yon Ok Ryu, Mi Hee Lim, Rita Song, Kwan Mook Kim, Wonwoo Nam “Parallel Mechanistic Studies on the Counterion Effect of Manganese Salen and Porphyrin Complexes on Olefin Epoxidation by Iodosylarenes” *J. Inorg. Biochem.* **2005**, *99*, 424-431.

**2. Wonwoo Nam**, Yon Ok Ryu, **Woon Ju Song** “Oxidizing Intermediates in Cytochrome P450 Model Reactions” *J. Biol. Inorg. Chem.* **2004**, *9*, 654-660.

**1. József Kaizer**, Eric J. Klinker, Na Young Oh, Jan-Uwe Rohde, **Woon Ju Song**, Audria Stubna, Jinheung Kim, Eckard Münck,, Wonwoo Nam, Lawrence Que, Jr. “Nonheme Fe<sup>IV</sup>O Complexes That Can Oxidize the C-H Bonds of Cyclohexane at Room Temperature” *J. Am. Chem. Soc.* **2004**, *126*, 472-473.

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## **Patent**

PCT/KR2022/016093 (20 October 2022)

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## **Presentations (Conference/Symposium)**

The 10<sup>th</sup> Asian Biological Inorganic Chemistry Conference, Dec. 3, **2022**, “Exploration and Evolution of Metal-dependent Dioxygenases”

The 19th Korea-Japan Joint Symposium in Inorganic Chemistry, Nov. 25, **2022**, “Hydrophobic Residues in the Secondary Coordination Spheres Dictate Metal-specific Dioxygenase Activities”

International Kyoto Symposium on Organic Chemistry, Nov. 9, **2022**, “Proteins as Marvelous Scaffolds for Designable and Evolvable Catalysts”

Korean Chemical Society Meeting, Oct. 20, **2022**, “Directed evolution as a versatile tool to explore metal-dependent enzyme catalysis”

The 8th Asian Conference on Coordination Chemistry (ACCC), Aug. 9, **2022**, “Design and Directed Evolution of Noncanonical  $\beta$ -Stereoselective Metalloglycosidases”.

The 51<sup>st</sup> KAST International Symposium, Jun. 16, **2022**, “Hydrophobic Residues in the Secondary Coordination Spheres Dictate the Metal-Specificity of Quercetin Dioxygenases”.

Korean Chemical Society Meeting, CET/SRC Symposium, Apr. 13, **2022**, “Symmetry-adapted Synthesis of Tailor-made Dicopper Oxidases”.

Pacificchem: Directed Protein Evolution, Dec. 19, **2021**, Oral Presentation “Symmetry-guided and chemical pressure-dependent evolution of denovo metallo- $\beta$ -Lactamases”.

JBIC Symposium–Artificial Metallocatalysis towards *in vivo* applications, Apr. 29, **2021**, Oral Presentation “Design and Evolution of De Novo Oligomeric Metalloenzymes”

The 127<sup>th</sup> KCS meeting, Apr. 22, **2021**, Oral Presentation “Programming Supramolecular Protein Architectures by Selective Metal-Coordinate Bonding”

The 24<sup>th</sup> KPPS Symposium, Nov. 27–28, **2020**, Oral Presentation “Unveiling Electrostatic Interactions in the Folding of Outer Membrane Protein”

Emerging Investigators Seminar (RSC Publishing Webinars), Nov. 25, **2020**, Oral Presentation “Symmetry-adapted Protein Assembly and Evolution”

International Online Bioinorganic Symposium, Nov. 11–12, **2020**, Oral Presentation “Rotational Axis as Promising Hotspots for Enzyme Evolution”

The 5<sup>th</sup> Korean Society for Enzyme Engineering, Gyeongju, Korea, Feb. 2-3, **2020**, Oral Presentation “Symmetry-Guided and Chemical Pressure-Dependent Evolution of De Novo Metallo- $\beta$ -Lactamases”

Metals in biology Gordon Research Conference, Ventura, CA, USA, Jan. 19-24, **2020**, Poster Presentation “Selective, Tunable, and Diverse Protein Assembly Driven by Metal and Chelating Amino Acids”

The 5th Korea-Taiwan-Japan Bioinorganic Chemistry Symposium in Taiwan, Nov. 12-14, **2019**, Oral Presentation

The 19th International Conference on Biological Inorganic Chemistry (ICBIC-19) in Interlaken, Switzerland, Aug. 11-16, **2019**, Oral Presentation “*De Novo* Design of  $\alpha$ -Helical and  $\beta$ -Barrel Metallohydrolases”

The ArtZymes 2.0 in Basel, Switzerland, Aug. 9-11, **2019**, Oral Presentation “Chemical Pressure-Dependent Evolution of De Novo Metallohydrolases”

The International Conference on Bioinspired Small Molecule Activation/The 23th Korean Bioinorganic Symposium in Seoul, Korea, Jun. 7-8, **2016**, Oral Presentation "Chemical Pressure-Dependent Evolution of De Novo Metallohydrolases"

The 123th Korean Chemical Society Meeting in Suwon, Korea, Apr. 17-19, **2019**, Oral Presentation "Protein Design and Enzyme Evolution using X-ray Crystallography"

The 9th Asian Biological Inorganic Chemistry (AsBIC) Conference, Singapore, 9-14. Dec, **2018**, Oral Presentation “Emergence and evolution of metalloenzymes”

The 43<sup>rd</sup> International Conference on Coordination Chemistry, Sendai, Japan, Jul. 30-Aug. 4, **2018**, Oral Presentation “*De Novo* Design of Artificial Metallo-Hydrolases”

Biocatalysis Gordon Research Conference, University of New England, ME, USA, Jul. 8-13, **2018**, Poster Presentation “Structure-guided Metagenomic Discovery and Characterization of Rifamycin ADP-ribosyltransferases”

The 4th Korea-Taiwan-Japan Bioinorganic Chemistry Symposium in KAIST, Korea, May 31-Jun. 1, **2018**, “Emergence of Structural and Functional Diversities of Metallo- $\beta$ -Lactamases”

Ewha BK symposium in Seoul, Korea, Jul. 3, **2018**, “Emergence of Catalytic Efficiency and Substrate Specificity of *De Novo* Metalloenzymes”

Korean Chemical Society-2018 Winter workshop: Life Science for New Frontiers, Seoul, Korea, Jan 29-30, **2018**, “*De Novo* Metalloenzymes from Protein Design and Directed Evolution”

The 8th International Collaborative & Cooperative Chemistry Symposium in Hyderabad, India, Dec. 18-19, **2017**, “*De Novo* Design and Directed Evolution of Artificial Metalloenzymes”

The 17th Korea-Japan Joint Symposium on Organometallic and Coordination Chemistry in Busan, Korea, Nov. 3-5, **2016**, "Design of a *De Novo* Metallo-Hydrolase with *In Vivo* Activity"

The 4th Seoul National University-Paris Diderot University Symposium: Chemistry for Sustainable Future, Oct. 18-19, **2016**, "Design of a *De Novo* Metallo-Hydrolase with *In Vivo* Activity"

The 118th Korean Chemical Society Meeting in Busan, Korea, Oct. 12-14, **2016**, "Design of a *De Novo* Metallo-Hydrolase with *In Vivo* Activity"

The 3rd Japan-Korea-Taiwan Bioinorganic Chemistry Symposium, Sep. 29-30, **2016**, Design of a *De Novo* Metallo-Hydrolase with *In Vivo* Catalytic Activity"

The 15th KIAS Conference on Protein Structure and Function, Sep. 22-24, **2016**, "Design of a *De Novo* Metallo-Hydrolase with *In Vivo* Activity"

The 20th Korean Bioinorganic Symposium, Jul. 18-19, **2016**, "Design of a *De Novo* Metallo-Hydrolase with *In Vivo* Catalytic Activity"

Korean Inorganic Symposium in Busan, Korea, Jul. 7-8, **2016**, "Design of a *De Novo* Metallo-Hydrolase with *In Vitro* and *In Vivo* Activity"

20th Korean Protein and Peptide Society (KPPS) Symposium in Yangyang, Korea, Jun. 24-25, **2016**, "Design of a *De Novo* Metallo-Hydrolase with *In Vivo* Activity"

The 1st Postdoc Symposium in the Department of Chemistry at University of California, San Diego, CA, **2015**, Oral Presentation.

Metals in Biology Gordon Research Conference, Ventura, CA, Jan. 25-Jan. 30, **2015**, Poster Presentation "A Designed Supramolecular Protein Assembly with *In Vivo* Enzymatic Activity"

The 240th American Chemical Society National Meeting & Exposition, Boston, MA, Aug. 22-26, **2010**, Oral Presentation "Dioxygen Activation in T201 Variants of Toluene/*o*-Xylene Monooxygenase Hydroxylase from *Pseudomonas sp.* OX1"

The Microbial Systems (and beyond) Seminar @ Parsons at MIT, Cambridge, MA, Oct. 12, **2010**, Oral Presentation "Proton and Dioxygen Transfer in Toluene/*o*-Xylene Monooxygenase Hydroxylase"

Frontiers in Metallobiochemistry at The Penn State University, University Park, PA, June 2-5, **2010**, Poster Presentation "Dioxygen Activation in T201 Variants of Toluene/*o*-Xylene Monooxygenase Hydroxylase from *Pseudomonas sp.* OX1"

Metals in Biology Gordon Research Conference, Ventura, CA, Jan. 31-Feb. 5, **2010**, Poster Presentation "Dioxygen Activation in T201 Variants of Toluene/*o*-Xylene Monooxygenase Hydroxylase from *Pseudomonas sp.* OX1"

Bioinorganic Gordon Research Seminar Ventura, CA, Feb. 4-7, **2010**, Poster Presentation "Dioxygen Activation in T201 Variants of Toluene/*o*-Xylene Monooxygenase Hydroxylase from *Pseudomonas sp.* OX1"

The 2005 International Chemical Congress of Pacific Basin Societies (Pacifichem), Hawaii, HI, Dec. 15-Dec. 20, **2005** Poster Presentation "Oxoiron(IV) Porphyrin  $\pi$ -Cation Radical Complexes with a Chameleon Behavior in Cytochrome P450 Model Reactions"

The Second Asian Biological Inorganic Chemistry Conference in conjunction with Third Symposium on Advances in Bioinorganic Chemistry, Goa, India, Dec. 5-10, **2004**, Poster Presentation "Oxoiron(IV) Porphyrin  $\pi$ -Cation Radical Complexes with a Chameleon Behavior in Cytochrome P450 Model Reactions"

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## **Invited Talks (Seminars)**

Biomedicine & Health Science at the Catholic University of Korea, Nov. 28, **2019**, “Discovery, Design, and Directed Evolution of Novel Enzymes”

IBS Center for Molecular Spectroscopy and Dynamics, Jan. 31, **2019**, “Coordination Chemistry with Proteinaceous Ligands”

Department of Chemistry at Gwangju Institute of Science and Technology, Sep. 26, **2017**, “From Inorganic Chemistry to Protein Engineering”

Department of Chemistry at Korea University, Mar. 9, **2017**, "Inorganic Chemistry in Proteinaceous Environments"

Department of Chemistry at Gachon University, Dec. 21, **2016**, "Dynamic Interplay between Metal Ions and Protein Architectures"

Department of Chemistry at Yonsei University, Nov. 17, **2016**, "Dynamic Interplay between Metal Ions and Protein Architectures"

Department of Chemistry at Chung-Ang University, Nov. 10, **2016**, "Dynamic Interplay between Metal Ions and Protein Architectures"

Department of Chemistry at Pohang University of Science and Technology, Oct. 7, **2016**, "Dynamic Interplay between Metal Ions and Protein Architectures"

Department of Chemistry at Sogang University, Oct. 5, **2016**, "Dynamic Interplay between Metal Ions and Protein Architectures"

Department of Chemistry at Korea Advanced Institute of Science and Technology, Jun. 1, **2016**, "Dynamic Interplay between Metal Ions and Protein Architectures"

Department of Chemistry at Seoul National University, Mar. 3, **2016**, "Orchestrated Interplay of Metal Ions and Protein Architectures"

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