

Sumin Lee

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EDUCATION

University of California, Berkeley – California, USA

- Ph. D. Candidate in Chemistry (expected 2018), Thesis Advisor: Prof. Christopher J. Chang
- Thesis Topic: “Molecular and Materials Sensors for Metals in Biological and Environmental Samples”

Ewha Womans University – Seoul, Korea

- Master of Bioinspired Science (2012), Bachelor of Science, Chemistry (2010), Bachelor of Science, Self-Designed Major (Science, Life and Society, 2010), Research Advisor: Prof. Wonwoo Nam
 - Thesis Topic: “Metal Ion-Responsive Photofunctional Organic Molecules”
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SCHOLARSHIP AND AWARDS

- Mar and Sep 2011 **Research Assistant Scholarship** for employed student to assist academic research
 - Aug 2010 Graduate as **MAGNA CUM LAUDE**
 - From 2007 to 2009 **Honor Scholarship** for superior academic student
 - Mar 2008 **Academic Incentive Scholarship** for student who qualified for Scranton College, an honors program at Ewha available to superior academic students
 - Mar 2008 **Hong Seoung Dae Scholarship** for superior academic student
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PUBLICATIONS

- **S. Lee**, P. Liu, N. Yuki, I. Hamachi, E. Miller, C. J. Chang “Ligand-Directed Acyl Imidazole Chemistry for Labeling Proteins in Copper-Rich Compartments in Cells and Neurons”, *Manuscript in preparation*
- **S. Lee**, A. Uliana, M. K. Taylor K. Chakarawet, S. R. S. Bandaru, S. Gul, R. Chatterjee, C. M. Ackerman, J. Xu, J. A. Reimer, J. Yano, A. Gadgil, J. R. Long and C. J. Chang “Iron Capture in a Functionalized Porous Polymer Applied to Remediation and Detection in Environmental Water Samples”, *Paper submitted*
- S. N.W. Toussaint, R. T. Calkins, **S. Lee**, B. W. Michel. “An Olefin Metathesis-Based Fluorescent Probe for the Selective Detection of Ethylene in Live Cells”, *J. Am. Chem. Soc.* **2018**, *140*, *41*, 13151-1315
- C. M. Ackerman, **S. Lee**, C. J. Chang. “Analytical Methods for Imaging Metals in Biology: From Transition Metal Metabolism to Transition Metal Signaling”, *Anal. Chem.* **2017**, *89*, 22-41
- **S. Lee**, G. Barin, C. M. Ackerman, A. Muchenditsi, J. Xu, J. A. Reimer, S. Lutsenko, J. R. Long and C. J. Chang “Copper Capture in a Thioether-Functionalized Porous Polymer Applied to the Detection of Wilson’s Disease”, *J. Am. Chem. Soc.* **2016**, *138*, 7603-7609
- **S. Lee**, Y. You, K. Ohkubo, S. Fukuzumi, and W. Nam “Highly Efficient Cycloreversion of Photochromic Dithienylethene Compounds Using Visible Light-Driven Photoredox Catalysis”, *Chem. Sci.*, **2014**, *5*, 1463-14
- **S. Lee**, Y. You, K. Ohkubo, S. Fukuzumi, and W. Nam “Photoelectrocatalysis to Improve Cycloreversion Quantum Yields of Photochromic Dithienylethene Compounds”, *Angew. Chem., Int. Ed.*, **2012**, *51*, 13154-13158
- **S. Lee**, Y. You, K. Ohkubo, S. Fukuzumi, and W. Nam “Mechanism and Fluorescence Application of Electrochromism in Photochromic Dithienylcyclopentene”, *Org. Lett.*, **2012**, *14*, 2238-2241
- J. E. Kwon, **S. Lee**, Y. You, K.-H. Baek, K. Ohkubo, J. Cho, S. Fukuzumi, I. Shin, S. Y. Park, and W. Nam, “Fluorescent Zinc Sensor with Minimized Proton-Induced Interferences: Photophysical

Mechanism for Fluorescence Turn-On Response and Detection of Endogenous Free Zinc Ions”, *Inorg. Chem.* **2012**, *51*, 8760–8774

- Y. You, **S. Lee**, T. Kim, K. Ohkubo, W.-S. Chae, S. Fukuzumi, G.-J. Jhon, W. Nam, and S. J. Lippard, “Phosphorescent Sensor for Biological Mobile Zinc”, *J. Am. Chem. Soc.* **2011**, *133*, 18328–18342
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PATENT

C. J. Chang, J. R. Long, **S. Lee**, G. Barin, 2016, SYSTEMS AND METHODS FOR DETECTING METAL ION CONCENTRATIONS IN SUBJECTS. U.S. Patent Application 62337627, filed May 2016.

PRESENTATIONS

- **Sumin Lee**. (2017, Apr) *Oral presentation “Frameworks for Capturing Copper and Iron Ions in Biological and Environmental Samples” at the 2017 ACS Inorganic chemistry, San Francisco, USA*
 - **Sumin Lee**. (2012, Jun) *Oral presentation “Metal-Ion Responsive Photofunctional Organic Molecules” at the 2012 KCS Inorganic chemistry department summer symposium, Yongin-si, Korea*
 - **Sumin Lee**, Youngmin You, and Wonwoo Nam (2012, Apr) *Poster presented at the 109th General Meeting of the Korean Chemical Society, Ilsan, Korea*
 - **Sumin Lee**, Youngmin You, Soo Young Park, Shunichi Fukuzumi, Injae Shin, and Wonwoo Nam (2011, Oct) *Poster presented at the 108th Autumn Meeting of the Korean Chemical Society, Daejeon, Korea*
 - Youngmin You, **Sumin Lee**, Wonwoo Nam, and Stephen J. Lippard (2010, Nov) *Poster presented at the 5th Asian Biological Inorganic Chemistry Conference, Kaohsiung, Taiwan*
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RESEARCH SUMMARY

Sep 2018 – Current **Postdoc, Matt Lab, Stanford University**

- Synthesizing the near-IR fluorescent probe conjugated with selective inhibitor of serine hydrolase enzyme
- Studying the role of the serine hydrolase enzyme, fphB, in the development of the biofilm
- Synthesizing microbubbles linked to the selective enzyme inhibitor and imaging with the biofilm.

Sep 2013 – Aug 2018 **Ph.D. Student, Chang Lab, University of California, Berkeley**

- Synthesizing copper and iron selective porous aromatic frameworks with high surface area and high thermal/chemical stability
- Investigating copper and iron uptake properties of porous frameworks in buffer solutions and selectivity for copper and iron over other biological abundant metal ions, respectively
- Applying copper selective frameworks to biofluid samples to read out copper concentrations and iron selective frameworks to ground water samples to detect iron concentrations
- Visualizing copper and iron concentrations in frameworks by applying colorimetric molecules to optimize the current biofluid tests of Wilson’s disease for copper and analogous tests for iron.
- Developing a trappable fluorescent sodium sensor for imaging sodium in living cells

Sep 2010 – Aug 2012 **Masters Student, Nam Lab, Ewha Womans University, Seoul, Korea**

- Studying photoluminescent sensors capable of imaging exogenous and endogenous zinc ions and establishing zinc-responsive turn-on mechanism
 - Synthesizing dithienylethene molecules with varying substituents which alter the electron density on the photochromic core
 - Investigating electrochromism of photochromic dithienylethene molecules initiated by one-electron oxidant, which occurs at differing rates as a function of the core electron density
 - Incorporating fluorescence memory modulated by intramolecular FRET (Fluorescence-Resonance Energy Transfer) and combination of photochromism and electrochromism
 - Improving ring-opening quantum yield by employing a photoredox catalyst
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