



•Field Physical/Organic Chemistry •Office College of Engineering 1347
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Educational Background

- 2014-2020
KAIST (Ph.D. Department of Chemistry)
- 2011-2014
KAIST (B.S. Department of Chemistry)

Major Careers

- 2022-present
Department of Chemistry, Hallym University
Assistant Professor
- 2020-2022: Department of Chemistry, KAIST,
Postdoctoral Associate

Major research Interests

- Material-Independent Coating/Interface Engineering
- Molecular Self-Assembly
- Cell-Material Interfaces
- Biomimetic Chemistry

Publications

22. Cell-in-Catalytic-Shell Nanoarchitectonics: Catalytic Empowerment of Individual Living Cells by Single-Cell Nanoencapsulation. Lee, H.; Park, J.; Kim, N.; Youn, W.; Yun, G.; Han, S. Y.; Nguyen, D. T.; Choi, I. S.* *Adv. Mater.* 2022, 34(30), 2201247.

21. Hydrogen Bonding-Based Layer-by-Layer Assembly of Nature-Derived Eggshell Membrane Hydrolysates and Coffee Melanoidins in Single-Cell Nanoencapsulation. Han, S. Y.; Yun, G.; Nguyen, D. T.; Kang, E. K.; Lee, H.; Kim, S.; Kim, B. J.; Park, J. H.; Choi, I. S.* *ChemNanoMat* 2022, 8(5), e202100535.

20. Enzyme-Mediated Kinetic Control of Fe³⁺-Tannic Acid Complexation for Interface Engineering. Lee, H.; Nguyen, D. T.; Kim, N.; Han, S. Y.; Hong, Y. J.; Yun, G.; Kim, B. J.*; Choi, I. S.* *ACS Appl. Mater. Interfaces*. 2021, 13(44), 52385-52394.

19. Enzyme-Mediated Film Formation of Melanin-Like Species from ortho-Diphenols: Application to Single-Cell Nanoencapsulation. Kim, N.; Lee, H.; Han, S. Y.; Kim, B. J.*; Choi, I. S.* *Appl. Surf. Sci. Adv.* 2021, 5, 100098.
18. A Decade of Advances in Single-Cell Nanocoating for Mammalian Cells. Lee, H.; Kim, N.; Rheem, H. B.; Kim, B. J.; Park, J. H.; Choi, I. S.* *Adv. Healthcare Mater.* 2021, 10(13), 2100347.
17. Single-Cell Nanoencapsulation of *Saccharomyces cerevisiae* by Cytocompatible Layer-by-Layer Assembly of Eggshell Membrane Hydrolysate and Tannic Acid. Han, S. Y.; Lee, H.; Nguyen, D. T.; Yun, G.; Kim, S.; Park, J. H.*; Choi, I. S.* *Adv. NanoBiomed Res.* 2021, 1(1), 2000037.
16. Reversed Anionic Hofmeister Effect in Metal-Phenolic-Based Film Formation. Yun, G.; Kang, D.; Rheem, H. B.; Lee, H.; Han, S. Y.; Park, J.; Cho, W. K.; Han, S. M.; Choi, I. S.* *Langmuir* 2020, 36(51), 15552-15557.
15. Ascorbic Acid-Mediated Reductive Disassembly of Fe³⁺-Tannic Acid Shells in Degradable Single-Cell Nanoencapsulation. Lee, H.; Park, J.; Han, S. Y.; Han, S.; Youn, W.; Choi, H.; Yun, G.; Choi, I. S.* *Chem. Commun.* 2020, 56(89), 13748-13751.
14. Dynamic Electrophoretic Assembly of Metal-Phenolic Films: Accelerated Formation and Cytocompatible Detachment. Yun, G.; Youn, W.; Lee, H.; Han, S. Y.; Oliveira, M. B.; Cho, H.; Caruso, F.; Mano, J. F.; Choi, I. S.* *Chem. Mater.* 2020, 32(18), 7746-7753.
13. Coffee Melanoidin-Based Multipurpose Film Formation: Application to Single-Cell Nanoencapsulation. Kim, J. Y.; Kim, S.; Han, S.; Han, S. Y.; Passos, C. P.; Seo, J.; Lee, H.; Kang, E. K.; Mano, J. F.; Coimbra, M. A.; Park, J. H.*; Choi, I. S.* *ChemNanoMat* 2020, 6(3), 379-385.
12. The Biomolecular Corona in 2D and Reverse: Patterning Metal-Phenolic Networks on Proteins, Lipids, Nucleic Acids, Polysaccharides, and Fingerprints. Yun, G.; Richardson, J. J.; Capelli, M.; Hu, Y.; Besford, Q. A.; Weiss, A. C. G.; Lee, H.; Choi, I. S.; Gibson, B. C.; Reineck, P.; Caruso, F.* *Adv. Funct. Mater.* 2020, 30(11), 1905805.
11. Iron Gall Ink Revisited: Natural Formulation for Black Hair-Dyeing. Han, S. Y.; Hong, S.-P.; Kang, E. K.; Kim, B. J.; Lee, H.; Kim, W. I.; Choi, I. S.* *Cosmetics* 2019, 6(2), 23-28.
10. Iron Gall Ink Revisited: In Situ Oxidation of Fe(II)-Tannin Complex for Fluidic-Interface Engineering. Lee, H.; Kim, W. I.; Youn, W.; Park, T.; Lee, S.; Kim, T.-S.; Mano, J. F.; Choi, I. S.* *Adv. Mater.* 2018, 30(49), 1805091.
9. Salt-Induced, Continuous Deposition of Supramolecular Iron(III)-Tannic Acid Complex. Park, T.; Kim, W. I.; Kim, B. J.; Lee, H.; Choi, I. S.*; Park, J. H.*; Cho, W. K.* *Langmuir* 2018, 34(41), 12318-12323.

8. Magnetization of Individual Yeast Cells by In Situ Formation of Iron Oxide on Cell Surfaces. Choi, J.; Lee, H.; Choi, I. S.; Yang, S. H.* *Solid. State Sci.* 2017, 71, 29-32.
7. Turning Diamagnetic Microbes into Multinary Micro-Magnets: Magnetophoresis and Spatio-Temporal Manipulation of Individual Living Cells. Lee, H.; Hong, D.; Cho, H.; Kim, J. Y.; Park, J. H.; Lee, S. H.; Kim, H. M.; Fakhruddin, R. F.; Choi, I. S.* *Sci. Rep.* 2016, 6, 38517.
6. Artificial Spores: Cytocompatible Coating of Living Cells with Plant-Derived Pyrogallol. Kim, J. Y.; Lee, H.; Park, T.; Park, J.; Kim, M.-H.; Cho, H.; Youn, W.; Kang, S. M.*; Choi, I. S.* *Chem. Asian J.* 2016, 11(22), 3183-3187.
5. A Degradable Polydopamine Coating Based on Disulfide-Exchange Reaction. Hong, D.; Lee, H.; Kim, B. J.; Park, T.; Choi, J. Y.; Park, M.; Lee, J.; Cho, H.; Hong, S.-P.; Yang, S. H.; Jung, S. H.; Ko, S.-B.; Choi, I. S.* *Nanoscale* 2015, 7(47), 20149-20154.
4. Layer-by-Layer-Based Silica Encapsulation of Individual Yeast with Thickness Control. Lee, H.; Hong, D.; Choi, J. Y.; Kim, J. Y.; Lee, S. H.; Kim, H. M.; Yang, S. H.; Choi, I. S.* *Chem. Asian J.* 2015, 10(1), 129-132.
3. Organic/Inorganic Double-Layered Shells for Multiple Cytoprotection of Individual Living Cells. Hong, D.; Lee, H.; Ko, E. H.; Lee, J.; Cho, H.; Park, M.; Yang, S. H.; Choi, I. S.* *Chem. Sci.* 2015, 6(1), 203-208.
2. Direct, Noncovalent Coating of a Gold Surface with Polymeric Self-Assembled Monolayers. Lee, H.; Hong, D.; Jon, S.; Choi, I. S.* *Bull. Korean Chem. Soc.* 2013, 34(12), 3541-3542.
1. Microfabricated Ratchet Structures for Concentrating and Patterning Motile Bacterial Cells. Kim, S. Y.; Lee, E. S.; Lee, H. J.; Lee, S. Y.; Lee, S. K. Lee*; Kim, T.* *J. Micromech. Microeng.* 2010, 20, 095006.