

Soojung Yi, Ph.D.

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EDUCATION

Ph.D. in Chemistry – 2025

Seoul National University, Seoul, Korea

Dissertation: *Single Protein Imaging Techniques for Direct Observation of Protein-Protein Interactions and Dynamics in a Living Bacterial Cell* (**Best Doctoral Dissertation Award**)

Advisor: Prof. Nam Ki Lee

B.S. in Chemistry, Biological Sciences (Double Major) – 2017

Seoul National University, Seoul, Korea

Thesis: *Regulation of Asr by DegP in E. coli;*

Revealing Molecular Mechanism of PHF7 by X-ray Crystallography (**Best Thesis Award**)

Advisors: Prof. Seokhee Kim; Prof. Hee-Jung Choi

RESEARCH EXPERIENCE

Postdoctoral Fellow, Research Institute for Basic Sciences, Seoul National University (Sep 2025–Present)

Biophysical Chemistry PhD Candidate, Single-molecule & Cell Biology Lab, Department of Chemistry, Seoul National University (Sep 2017–Aug 2025)
Advisor: Prof. Nam Ki Lee

- Developed KD-FRET for in-cell quantification of PPI strength (*Advanced Science*, Editor's Choice)
- Led gene expression kinetics study in *Vibrio natriegens*, the fastest-growing bacterium, overcoming host-related challenges
- Applied microfluidics for long-term intracellular protein tracking in live bacteria
- Conducted NMR-based structural analysis of VAMP2 and α-synuclein interactions

Undergraduate Researcher, Laboratory of Structural Biology, School of Biological Sciences, Seoul National University (Feb 2017–Jul 2017)
Advisor: Prof. Hee-Jung Choi

- Determined PHF7 structure by X-ray crystallography using proteins purified from Sf9 insect cells

Undergraduate Researcher, Systems Neuroscience Lab, Department of Chemistry, Seoul National University (Sep 2016–Feb 2017)

Advisor: Prof. Sung-Yon Kim

- Gained hands-on experience in mouse handling, perfusion, genotyping, stereotaxic surgery, immunohistochemistry, and behavioral tests.
- Trained in CLARITY, expansion microscopy, and two-photon microscopy.

IROP Research Intern, Department of Chemistry, Imperial College London (Jun 2016–Aug 2016)

Advisor: Dr. Keith Willison

- Cloned plasmids expressing *Plasmodium falciparum* PfPLP1A/B, regulators of malaria-related chaperonin CCT.

Undergraduate Researcher, Laboratory of Apoptosis & Molecular Disease, School of Biological Sciences, Seoul National University (Feb 2016–Jun 2016)

Advisor: Prof. Yong-Keun Jung

- Performed cell-based library screening to identify modulators of α-synuclein and tau internalization and propagation.

Undergraduate Researcher, Laboratory of Proteolytic Systems, Department of Chemistry, Seoul National University (Dec 2014–Feb 2016)

Advisor: Prof. Seokhee Kim

- Performed gene cloning, protein purification, and enzymatic assays to investigate the functional relationship between heat shock protease DegP and acid shock protein Asr.

TECHNICAL SKILLS

Molecular & Cellular Biology

- Plasmid-based cloning, chromosomal recombination, CRISPR/Cas9 genome editing in *Escherichia coli* and *Vibrio natriegens*
- RNA extraction, qRT-PCR, single-molecule FISH

Protein Chemistry & Biochemical Assays

- Protein expression and purification (including isotope-labeled proteins)
- Site-specific fluorescent labeling of proteins

Microscopy & Imaging Analysis

- Wide-field, confocal, and DIC microscopy
- Live-cell fluorescence imaging
- Microfluidics for single-cell imaging and analysis

Analytical Techniques & Instrumentation

- CD spectroscopy, ITC
- HPLC, MALDI-TOF MS
- UV–Vis spectrophotometry, fluorometry, microplate-based absorbance/fluorescence assays

Computational Tools & Data Analysis

- MATLAB, LabVIEW, Origin, POKY (NMR analysis), ImageJ (image processing)
 - Bioinformatics tools (BLAST, Clustal Omega, PyMOL)
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PUBLICATIONS

([†]co-first authors, ^{*}corresponding authors)

- **S Yi**, Y Ahn, NK Lee^{*} (2025).
Advances in methodologies for quantifying protein–protein interactions in living cells.
Bulletin of the Korean Chemical Society, 46(6), 574-586. (**Invited contribution**)
 - **S Yi**[†], E Kim[†], S Yang, G Kim, DW Bae, SY Son, BG Jeong, JS Ji, HH Lee, JS Hahn, SS Cha, YJ Yoon^{*}, NK Lee^{*} (2025).
Direct Quantification of Protein–Protein Interactions in Living Bacterial Cells.
Advanced Science, 2414777. (**Editor’s Choice**)
 - SY Son[†], DW Bae[†], E Kim[†], BG Jeong, MY Kim, SY Youn, **S Yi**, G Kim, JS Hahn, NK Lee, YJ Yoon^{*}, SS Cha^{*} (2024).
Structural investigation of the docking domain assembly from trans-AT polyketide synthases.
Structure, 32(9), 1477-1487.
 - S Yang[†], S Park[†], JB Son, S Kim, **S Yi**, G Bu, NK Lee^{*} (2023).
Co-transcriptional translation amplifies mRNA noise in *Escherichia coli*.
bioRxiv, 2023-10.
 - **S Yi**, … , NK Lee^{*}
Deciphering the Dynamics of Genetic Information Flow in the Rapidly Growing Bacterium, Vibrio natriegens, in preparation
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PRESENTATIONS

Oral Presentations

- **Korean Physical Society (KPS) Fall Meeting**, Changwon, Korea (Oct 2023)
Direct Measurement of the Strength of Protein-Protein Interactions Within Living Bacterial Cells by Accurate FRET Imaging
- **Center for Quantum Dynamics Summer Workshop 2025**, Yangpyeong, Korea (Aug 2025)
KD-FRET: Accurate quantification of protein-protein interaction strength in living bacteria

Poster Presentations

- Korean Physical Society (KPS) Fall Meeting, Gwangju, Korea (Oct 2025)
- Korean Physical Society (KPS) Fall Meeting, Yeosu, Korea (Oct 2024)
- 134th General Meeting of the Korean Chemical Society (KCS), Daegu, Korea (Oct 2024)
- Center for Quantum Dynamics Summer Workshop 2024, Gangneung, Korea (July 2024)
- Biophysical Society (BPS 2024) Annual Meeting, Philadelphia, USA (Feb 2024)
- 11th International Conference on Biological Physics (ICBP 2023), Seoul, Korea (Aug 2023)
- The 3rd Symposium on Biological Physics, Jeju, Korea (Jan 2023)
- 87th Harden Conference, Oxfordshire, UK (July 2022)
- 129th General Meeting of the Korean Chemical Society (KCS), Jeju, Korea (Apr 2022)
- Korean Physical Society (KPS) Fall meeting, Online (Oct 2021)
- 128th General Meeting of the Korean Chemical Society (KCS), Busan, Korea (Oct 2021)

AWARDS AND HONORS

- **Outstanding Female Graduate Student Award**, Korean Physical Society (2025)
- **Best Doctoral Dissertation Award**, College of Natural Sciences, Seoul National University (2025)
- **Excellent Poster Prize**, Korean Chemical Society (2022)
- **Outstanding Presentation Award**, Korean Physical Society (2021)
- **Merit-Based Scholarship**, Seoul National University (2018)
- **CHU Family Foundation Scholarship** (2017)
- **Best Thesis Award**, School of Biology Research Symposium, SNU (2017)
- **Best Poster Award**, Department of Chemistry Research Symposium, SNU (2015)

TEACHING AND OUTREACH EXPERIENCE

Mentored 8 students (6 undergraduates, 2 graduate students) in molecular biology and imaging techniques

Head Teaching Assistant (2022-2023, 3 sessions) and Teaching Assistant (2018-2021, 4 sessions) of SNU Science Camp for high school students

- Led the chemistry section of an intensive four-day residential science camp for high school students; designed and delivered lectures, coordinated lab sessions, and supervised 9 teaching assistants.

Teaching Assistant, Department of Chemistry, Seoul National University (2017–2021)

- Courses: General Chemistry I & II, Chemistry Lab, Advanced Molecular Spectroscopy, Seminar in Contemporary Chemistry

Content Development and Course Support

- Produced Korean/English subtitles for 30-week General Chemistry I lecture series (SNUON)
 - Led filming and appeared as primary demonstrator in General Chemistry Laboratory instructional videos (2021–2022)
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ACADEMIC SERVICE AND LEADERSHIP**Division Lead**, Biophysics Division, K-BioX Global Network

- Organized seminars, journal clubs, and expert networking sessions

Event Organizer, Department of Chemistry Sports Day, SNU (2018)**REFERENCES****Prof. Nam Ki Lee, Ph.D.**

Professor, Department of Chemistry, Seoul National University
Phone +82 2-880-2234
namkilee@snu.ac.kr

Prof. Sun-Shin Cha, Ph.D.

Professor, Department of Chemistry&Nanoscience, Ewha Womans University
Phone +82-2-3277-3858
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Prof. Seokhee Kim, Ph.D.

Associate Professor, Department of Chemistry, Seoul National University
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