

Soojung Yi, Ph.D.

Postdoctoral Fellow, Research Institute for Basic Sciences, Seoul National University
Seoul 08826, South Korea
Email: jomrupjr@snu.ac.kr | Mobile: +82-10-2587-5773

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)

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)

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
chajung@ewha.ac.kr

Prof. Seokhee Kim, Ph.D.

Associate Professor, Department of Chemistry, Seoul National University
Phone +82 2-880-4123
seokheekim@snu.ac.kr