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CONTACT INFORMATION

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RESEARCH INTERESTS

Neuroscience, Molecular and Cellular Neuroscience, Physiology, Biomedical imaging

EDUCATION

2021 - 2023 **M.S.** in Interdisciplinary Program in Neuroscience,
Seoul National University (Advisor: Dr. Sunghoe Chang)
Thesis: SCAMP5/AP-4 dependent trafficking mediates presynaptic localization of the core autophagy protein ATG9A

2016 - 2020 **B.E.** in Control and Instrumentation Engineering, Korea University
B.E. in Biomedical Engineering, Korea University

(2023 - 2025) Military service in Republic of Korea Air Force

PROFESSIONAL EXPERIENCE

2025 - ***Researcher***, Department of Physiology and Biomedical Sciences,
Seoul National University College of Medicine

2021 - 2023 ***Graduate student***, Interdisciplinary Program in Neuroscience M.S. Program,
Seoul National University

2020 - 2021 ***Researcher***, Department of Physiology and Biomedical Sciences,
Seoul National University College of Medicine

HONORS & AWARDS

2023 IBRO World Congress Travel Grant Award, 11th IBRO World Congress of Neuroscience IBRO 2023

2022 - 2023 Fellowship for Fundamental Academic Fields, Seoul National University

2021 Merit-based Scholarship, Seoul National University

2018 Merit Prize, Annual Capstone Design Conference, Korea University

2017 Poster Award, Annual Academic Conference on Electro-Mechanical Systems Engineering, Korea University

2016 Poster Award, Annual Academic Conference on Control and Instrumentation Engineering, Korea University

2016 Academic Excellence Award, Korea University

PUBLICATIONS

1. **Ryu SH**[†], Lee J[†], Lee U, Kim K, Jun GE, Oh J, Lee SE[*], Chang S[*]. (2025). SCAMP5 regulates AP-4-dependent sorting and trafficking of ATG9A for presynaptic autophagy

via PI4KB/PI4KIIIβ recruitment and PtdInsP4 production at the TGN. *Autophagy*, 1-20.
†Equal contribution

2. Eom M, Han S, Park P, Kim G, Cho ES, Sim J, Lee KH, Kim S, Tian H, Böhm UL, Lowet E, Tseng HA, Choi J, Lucia SE, Ryu SH, Rózsa M, Chang S, Kim P, Han X, Piatkevich KD, Choi M, Kim CH, Cohen AE, Chang JB, Yoon YG. (2023). Statistically unbiased prediction enables accurate denoising of voltage imaging data. *Nat Methods,* 20(10):1581-1592.
3. Lee BJ, Lee U, Ryu SH, Han S, Lee SY, Lee JS, Ju A, Chang S, Lee SH, Kim SH, Ho WK. (2023). L-type Ca2+ channels mediate regulation of glutamate release by subthreshold potential changes. *Proc Natl Acad Sci U S A,* 120(12):e2220649120.
4. Lee YH, Suh BK, Lee U, Ryu SH, Shin SR, Chang S, Park SK, Chung KC. (2022). DYRK3 phosphorylates SNAPIN to regulate axonal retrograde transport and neurotransmitter release. *Cell Death Discov*, 8(1):503.
5. Lee U, Ryu SH, Chang S. (2021). SCAMP5 mediates activity-dependent enhancement of NHE6 recruitment to synaptic vesicles during synaptic plasticity. *Mol Brain*, 14(1):47.
6. Lee U, Choi C, Ryu SH, Park D, Lee SE, Kim K, Kim Y, Chang S. (2021). SCAMP5 plays a critical role in axonal trafficking and synaptic localization of NHE6 to adjust quantal size at glutamatergic synapses. *Proc Natl Acad Sci U S A,* 118(82):e2011371118.

ORAL PRESENTATIONS

2023 SCAMP5/AP-4 dependent trafficking mediates presynaptic localization of the core autophagy protein ATG9A
Invited talk, Seoul National University College of Medicine, Seoul. March 20th

POSTER PRESENTATIONS (INTERNATIONAL)

1. Cho EJ, Lee H, Ryu SH, Goh Y, Chang S. Tau-synaptophysin interaction disrupts synaptic vesicle dynamics. (2024). The 25th Annual Meeting of the Korean Society for Brain and Neural Sciences.
2. **Ryu SH**, Lee J, Lee U, Kim K, Chang S. (2023). SCAMP5/AP-4 dependent trafficking mediates presynaptic localization of the core autophagy protein ATG9A. 11th IBRO World Congress of Neuroscience IBRO 2023.
   - Recipient of "Travel Grant Award"
3. Lee U, Ryu SH, Lee J, Chang S. Presynaptic localization of ATG-9 is regulated by SCAMP5 associated with AP-4 complex. (2022). The Federation of European Neuroscience Societies Forum 2022.
4. **Ryu SH**, Lee U, Lee J, Kim K, Chang S. TurboID-based proximity labelling reveals different interaction proteomes between SCAMP5 WT and G180W mutant. (2022). The 25th Annual Meeting of the Korean Society for Brain and Neural Sciences.
5. Lee U, Ryu SH, Lee J, Chang S. (2022). Presynaptic localization of ATG-9 for presynaptic autophagy is regulated by the interaction between SCAMP5 and AP-4 complex. The 25th Annual Meeting of the Korean Society for Brain and Neural Sciences.
6. Lee U, Ryu SH, Chang S. (2021). SCAMP5 mediates activity-dependent enhancement of NHE6 recruitment to synaptic vesicles during synaptic plasticity. The 24th Annual Meeting of the Korean Society for Brain and Neural Sciences.

POSTER PRESENTATIONS (DOMESTIC)

1. **Ryu SH**[†], Lee J[†], Lee U, Kim K, Jun GE, Oh J, Lee SE[*], Chang S[*]. (2025). SCAMP5 regulates AP-4-dependent sorting and trafficking of ATG9A for presynaptic autophagy via PI4KIIIβ recruitment and PtdInsP4 production at the TGN. The 2025 Summer

Conference of SNU Neuroscience Research Institute and Memory Network Medical Research Center.
†Equal contribution

2. **Ryu SH**, Lee U, Lee J, Kim K, Chang S. TurboID-based proximity labelling reveals different interaction proteomes between SCAMP5 WT and G180W mutant. (2022). The 2022 Fall Conference of SNU Neuroscience Research Institute and Memory Network Medical Research Center.

TEACHING

2023 *Teaching Assistant.* Seminars in Neuroscience 1, Seoul National University
2022 *Teaching Assistant.* Principles of Neuroscience 2, Seoul National University
2022 *Teaching Assistant.* Seminars in Neuroscience 2, Seoul National University
2022 *Teaching Assistant.* Selective Course 1 - Tissue Clearing & Expansion microscopy (ExM) Methods, Seoul National University College of Medicine.
2022 *Instructor.* Experiment Protocol Workshop - Expansion microscopy (ExM) Methods, Seoul National University College of Medicine.
2022 *Teaching Assistant.* Principles of Neuroscience 1, Seoul National University
2022 *Teaching Assistant.* Seminars in Neuroscience 1, Seoul National University
2017 *Teaching Assistant.* General Physics, Korea University