



# Woojin Bae

✉ | usmebbb@snu.ac.kr  | linkedin.com/in/woojinb  | woojinb.vercel.app

## Research Interests

### Investigation of Nanomaterials through Advanced Analytical Techniques

- **Nanomaterials:** Perovskite, Zeolite, Metal Oxide, Nanoparticle.
- **Advanced Analytical Techniques:** Transmission Electron Microscopy, Self-Driving Labs.

## Education

Bachelor's degree in Chemical and Biological Engineering   <b>Seoul National University</b>	<b>2020 - Present</b>
Exchange student in Chemical and Biomolecular Engineering   <b>North Carolina State University</b>	<b>Spring 2025</b>
Major in Chemistry   <b>Daejeon Science High School for the Gifted</b>	<b>2017 - 2020</b>

## Research Experience

<b>Self-Driving Fluidic Lab, NCSU</b> (Advisor: Prof. Milad Abolhasani) • Synthesized Mn-doped perovskite quantum dots (PQDs) leveraging a self-driving approach (ongoing)	<b>Jan. 2025 - May. 2025</b> <i>Raleigh, NC</i>
<b>Multi-dimensional Materials Chemistry Lab, SNU</b> (Advisor: Prof. Jungwon Park) • Synthesized Ag cluster-based AIGS (silver indium gallium sulfide)-core. • SEI Structures Dependent Li-Morphology Characterized by cryo-TEM; developed a protocol for quantitative analysis of SEI. • <b>Team Leader</b> of "Undergraduate Independent Study 1" regarding LMBs SEI Cryo-TEM analyzing.	<b>Mar. 2024 - Present</b> <i>Seoul, Korea</i>
<b>Center for Cell-Encapsulation Research, KAIST</b> (Advisor: Prof. Insung Choi) • Created a porous titanium oxide shell to facilitate the in-vitro culturing of astrocytes. • Confirmed the function of encapsulated astrocytes by analyzing the length of co-cultured neurons.	<b>Mar. 2018 - May. 2019</b> <i>Daejeon, Korea</i>

## Conference Presentations

SEI Structures Dependent Li-Morphology Characterized by Cryo-TEM. **Bae, W.**; Jeong, S.; Ji, S.; Jeon, Y.; Park, J.\*  
*The 2024 Annual Fall Conference of Korean Society of Microscopy*, Gyeongju, Korea (Nov 25, 2024). Poster Presentation.

Rethinking Life Choices Beyond the Child Penalty. **Bae, W.**; Miu Akutsu.; Park, J.; Xing Qing.  
*Tokyo Forum 2024: Shape the Future, Design for Tomorrow*, Tokyo, Japan (Nov 22-23, 2024). Oral Presentation.

Regulation of astrocyte growth using porous titanium oxide shells. **Bae, W.**; Lee, K.; Lee, C.; Kim, T.; Choi, I.\*  
*Korean Chemical Society Future Chemist Research Presentation*, Daegu, Korea (Oct 19, 2018). Poster Presentation.

Wettability Change of Self-Assembled Monolayers (SAMs) of Thiol on Gold. **Bae, W.**; Lee, K.; Lee, C.\*  
*The 51st Joint School Science Exhibition*, Hong Kong, Hong Kong (Aug 22-27, 2018). Poster Presentation

## Honors & Awards

<b>Excellence Undergraduate Research Award</b>   2024 Student-Directed Education Program Symposium • SEI Structures Dependent Li-Morphology Characterized by Cryo-TEM.	<b>Jan. 2025</b>
<b>Korea-U.S. Student Exchange Program in the field of high-tech industry</b>   Ministry of Trade, Industry and Energy • Awarded <b>\$9000 scholarship</b> as a STEM-specialized exchange student.	<b>Nov. 2024</b>
<b>Excellence Award</b>   Undergraduate Research Program for Advanced Equipment • Consideration on the relationship between microscopic structure and macroscopic shape according to the synthesis conditions of Hollow ZSM-5.	<b>Jan. 2024</b>
<b>Team Section Winner</b>   We Change SNU Contest • A spatial-restricted messenger allowing messages to be accessed only at SNUfestival locations designated by the sender.	<b>Jul. 2022</b>
<b>The Education and Research Foundation Scholarship</b>   College of Engineering, SNU	<b>Spring 2021</b>
<b>Merit-based Scholarship</b>   Department of Chemical and Biological Engineering, SNU	<b>Fall 2020</b>
<b>2020 Future Chemistry Talent Award</b>   The Korean Union of Chemical Science and Technology Societies • Awarded as one of the <b>top 6 science high school students</b> in Korea	<b>Feb. 2020</b>
<b>Excellence Poster Award</b>   2019 Gifted School R&E Joint Presentation Conference • Regulation of astrocyte growth using porous titanium oxide shells.	<b>Jan. 2019</b>
<b>Honorable Mention</b>   2017 Science Gifted and Talented Creative Research Conference • Correlation between Z-potential and contact angle of AuNPs solution.	<b>Jan. 2018</b>

## Leadership

- Tokyo Forum Youth Session** | The University of Tokyo & Chey Institute for Advanced Studies, Japan **Aug. 2024 - Nov. 2024**
- **Representative of Korea**, participated in the wrap-up session hosted by the President of the University of Tokyo.
- HKUST Entrepreneurship Bootcamp 2024** | Hong Kong University of Science and Technology, Hong Kong **Jul. 2024**
- Participated in a mock-up competition as a **team leader** and won the **third prize** for a worldwide healthcare platform.
- Marketing team & manager** | SNUfestival, Student council-affiliated organization, SNU **Jun. 2021 - May. 2022**
- Promoted the festival through the **online website** and video during the COVID-19 pandemic.
  - **Secured sponsorship** from a shared scooter company during the first in-person festival after the COVID-19 pandemic.
- Vice president** | Chemical and Biological Engineering Interim Leadership, SNU **Dec. 2020 - Mar. 2021**
- **Conducted freshman orientation**, via Zoom during the COVID-19 pandemic.

## Membership & Activities

- Undergraduate Membership** | Korean-American Scientists and Engineers Association **Jan. 2025 – Present**
- A non-profit organization that fosters collaboration and networking among Korean American scientists and engineers.
  - Gave a poster presentation on ‘SEI Structures Dependent Li-Morphology Characterized by Cryo-TEM’ at **Katalyst 2025**, a nationwide Korean American undergraduate conference.
- Young Engineers Honor Society** | National Academy of Engineering of Korea **Nov. 2024 - Present**
- Korean engineering honor society under National Academy of Engineering of Korea.
- SNU-UMN Culture Exchange Program** | The University of Minnesota, Minneapolis, MN **Mar. 2024**
- 2023 Winter Vacation Data Science Bootcamp: **Computing** (Certified) | Graduate School of Data Science, SNU **Feb. 2024**
- Republic of Korea Air Force** | Daegu, Korea **Aug. 2022 - May. 2024**
- 110<sup>th</sup> Squadron, operating the F-15K Slam Eagle. Selected as an **exemplary soldier**.
- SNU in EU program** | Brussels School of Governance, Belgium **Jul. 2022**
- Understanding European Unions, M2170.004600, delivered a presentation titled "The European External Action Service".
- Kansas Academy of Mathematics and Science Research Program** | Fort Hays State University, Hays, KS **Jul. 2018**
- Synthesized ZnSe quantum dots and applying them on Dye-sensitized solar cell. (Advisor: Prof. Arvin J. Cruz)

## Teaching & Mentoring Experiences

- Korean Language Peer Mentor** | Language Education Institute, SNU **Fall 2024**
- Learning Assistant** | Faculty of Liberal Education, SNU **Fall 2024**
- Basic Computing: First Adventures in Computing, L0444.000400.
- Lecturer, TEM Seminar** | Multi-dimensional Materials Chemistry Lab, SNU **May. 2024**
- Amplitude and Phase Contrast.
- Student Mentor, SNU Mentoring** | Seoul National University Social Responsibility **Apr. 2023 - Present**
- Provided career guidance to the middle school student from underserved communities, selected as a **superb mentor**.

## Skills & Languages

- **Instruments:** TEM, SEM, UV-Vis, OM, PL
- **Languages:** Korean (Native), English (C1, TOEFL 95)
- **Programming Languages:** Python, C, Html, CSS
- **Software:** Adobe Premiere Pro, Adobe illustrator, Fusion 360, Gatan DigitalMicrograph