

SuJi Kim

Tel: (+82) 10-4580-2698 | Email: sujikim2698@gmail.com

EDUCATION

The Catholic University of Korea <i>Bachelor of Engineering, Biomedical Chemical Engineering</i>	Bucheon, Republic of Korea 03/2021 - 02/2025
Marian University <i>Exchange Student</i>	Indianapolis, IN 01/2024 - 05/2024

RESEARCH EXPERIENCES

Biomaterials for Regenerative Medicine Lab, The Catholic University of Korea <i>Undergraduate Researcher</i>	Bucheon, Republic of Korea 07/2024 - 01/2025
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- Fabricated PFPE-PEGDA microfluidic chips with CO₂ laser-engraved channels, resulting in stable oil droplet generation with <2% CV
- Developed PTFE microfluidic devices for LNP synthesis, optimizing channel dimensions to achieve 9-fold higher flow rates without leakage
- Addressed particle aggregation from CO₂ laser-induced roughness using mechanical polishing and oxygen plasma, improving channel smoothness and particle uniformity

3D Printing-Based High-Efficiency Micromixer Design and Fabrication Capstone Research Project	Bucheon, Republic of Korea 09/2024 - 12/2024
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- Designed and fabricated a DLP-printed micromixer with helical channels, achieving a high mixing efficiency of 0.967 through geometric optimization
- Quantitatively analyzed fluorescence images to determine pixel-based mixing efficiency and investigate flow behavior in microchannels
- Demonstrated uniform LNP synthesis (~110 nm, PDI < 0.2) at high flow rates, highlighting its potential for scalable drug-delivery applications

High-Efficiency Spheroid Fabrication Platform Using Hydrophobic Surfaces <i>Department Academic Symposium (Awarded Research Presentations)</i>	Bucheon, Republic of Korea 07/2024 - 12/2024
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- Led a team to develop a 3D spheroid fabrication platform with hydrophobic surfaces using soft lithography and electrospun PU nanofibers, validating pattern transfer and surface morphology through SEM imaging
- Developed and optimized a two-step PDA and STA coating protocol to tailor surface chemistry and topography, confirmed by FTIR and AFM, resulting in enhanced hydrophobicity (contact angle >105°)
- Conducted cell culture experiments demonstrating that the modified surfaces promoted cell adhesion and spheroid formation, effectively mimicking the in-vivo microenvironment
- Developed a DLP-printed microfluidic device with an optimized hydrophobic surface, validating its fluidic performance for biomedical applications

Antimicrobial Evaluation of Ginger for Potential Topical Skin Applications <i>Academic Research Project</i>	Indianapolis, IN 01/2024 - 05/2024
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- Conducted a team-based microbiology project evaluating the antimicrobial effects of ginger essential oil, Ciprofloxacin, and sterile water against *E. coli* and *S. aureus*
- Analyzed quantitative data and presented findings in a poster session, highlighting the selective antimicrobial activity of ginger oil compared to standard antibiotics

EXTRACURRICULAR ACTIVITIES

Bio Big Data (Genomics) Analyst Training Program <i>Professional Bioinformatics Education (Korea Biotechnology Industry Organization)</i>	Seoul, Republic of Korea 06/2025 - 08/2025
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- Completed a 10-week intensive NGS data analysis program using Linux, Python, and R, covering Whole Genome, Exome, RNA, Targeted, Non-human resequencing, and Metagenome sequencing, trained by industry experts from Illumina, Macrogen, AWS, and other leading biotech companies.

- Analyzed gut microbiome sequencing data of hypertensive and CKD patients using QIIME2 and DADA2, generating ASVs, assigning taxonomy from phylum to species, and evaluating α -diversity and community structure via PCoA (Bray–Curtis)
- Developed and executed an RNA-Seq pipeline for *Arabidopsis thaliana* root samples under *Pseudomonas aeruginosa* infection, performing QC (fastp, Q30 >96%), alignment (TopHat2, >85% mapping), expression quantification and differential analysis (Cufflinks/Cuffdiff), and functional enrichment (g:Profiler, clusterProfiler)
- Developed a Random Forest model (scikit-learn) for the Breast Cancer dataset in a Bio Data Coding Competition, performing exploratory data analysis, visualization, and hyperparameter tuning (GridSearchCV), achieving an AUC of 0.984 and interpreting results in a biomedical context

SW Educational Volunteer Group

Seoul, Republic of Korea

Computing & Coding club (CodeWave)

10/2024 - 12/2024

- Organized and taught weekly computing workshops at the Gangnam District Daechi Library, introducing 10 elementary students to foundational concepts in programming and computing systems
- Guided students through creative project development, supporting them in building interactive Scratch works that enhanced their algorithmic thinking and design skills
- Conducted hands-on Python activities, including simple games like rock scissor paper and grammar exercises, to build confidence and spark interest in text-based coding

63rd NUSB National Undergraduate Biology Symposium

Seoul, Republic of Korea

Academic Symposium at Seoul National University

06/2024 - 09/2024

- Led weekly literature review sessions at the National Biology Symposium's Protein Engineering Division, coordinating team analyses on recent advances in directed evolution and computational protein design
- Delivered a main presentation on orthogonal synthetic timer circuits using ECF σ factors, demonstrating their scalability as regulatory elements for time-delayed gene expression in *E. coli* and *B. subtilis*

Chemistry Club

Indianapolis, IN

Chemistry Club at Marian University

01/2024 - 05/2024

- Led sustainability-focused science activities, including an eco-friendly dry ice experiment and a recycled-pendant workshop that repurposed over 30 pieces of Styrofoam, engaging about 15 students in hands-on learning about upcycling and environmental responsibility

WORK EXPERIENCE

Eduplex

Seoul, Republic of Korea

Instructor

01/2021 - 06/2024

- Mentored 30+ high school students in Calculus, Biology, and Chemistry, improving average grades by 7%, and developed personalized learning strategies through performance data analysis

AWARDS & HONORS

Ethical Leaders Rearing Program(ELP) Award

02/2025

- Selective award at graduation, honoring sustained effort and holistic development throughout the university experience, with well-rounded contributions in leadership, academics, and community engagement

BMCE LAB with ER(Education & Research) Project Award

12/2024

- Presented research findings as the lead presenter at a departmental academic symposium on the development of a high-efficiency spheroid platform using hydrophobic surfaces, awarded 3rd place

International Exchange Office club(CUBIG) Activity Scholarship

03/2022 - 12/2023

- Designed and implemented a one-on-one buddy program and various integration activities to support international students' cultural adjustment, successfully engaging over 150 participants