David Hyunyoo Jang

✉ hwjang00@snu.ac.kr in daylight00 ⬡ daylight-00 | US Citizen

EDUCATION

Seoul National University   **Mar 2022 – Feb 2028 (Expected)**
PharmD   *Seoul, South Korea*
Selected Coursework: Biochemistry · Pharmaceutical Statistics · Drug Delivery Systems

Korea University   **Mar 2019 – Aug 2021**
Coursework in Materials Science and Engineering (no degree)   *Seoul, South Korea*
Selected Coursework: Organic Nanomaterials · Fundamentals of Data Science

RESEARCH EXPERIENCE

AI Protein Design Lab, Korea Advanced Institute of Science and Technology (KAIST)   **Jun 2025 – Aug 2025**
Undergraduate Researcher (advisor: Gyu Rie Lee)   *Daejeon, South Korea*

- Designed de novo protein binders targeting *phenytoin* and *carbamazepine* using diffusion-based generation and multi-criteria triage (Rosetta interface scores, RMSD/pLDDT metrics from AlphaFold3, Boltz-2, TMalign, PLACER);
- Devised a backbone diversification and optimization strategy via iterative LigandMPNN–FastRelax cycles, which expanded the *carbamazepine* candidate pool ($21 \rightarrow 275$) and improved interface $\Delta\Delta G$ (*–25.4 $\rightarrow$ –31.6 kcal/mol*).
- Established a fully reproducible end-to-end binder design pipeline, and released as an open-source repository on GitHub.
- Implemented atom-wise bias conditioning functionality for relative accessible surface area (rASA) in RFdiffusion All-Atom.

Laboratory of Computational Drug Discovery, Seoul National University   **Jul 2023 – Aug 2025**
Undergraduate Researcher (advisor: Juyong Lee)   *Seoul, South Korea*

- Led development of PREpiBind, a transformer-based pMHC-II predictor; ran embedding ablations across AF3/Chai-1/Boltz-1, ESM series, and BLOSUM, selected ESM C Small for the best accuracy–size trade-off, achieved ROAUC 0.998 on MS datasets, and released a public web server (manuscript in prep).
- Benchmarked 27 LLMs on Korean Pharmacist Licensing Exam (2019–2024); built the evaluation framework and error taxonomy; 7 models passed all years, best reaching top-12% of human examinees (manuscript submitted).
- Reproduced a small-molecule discovery pipeline for CB1 receptor using AutoDock-GPU and the Enamine Hit Locator Library, automating QC and ranking scripts for high-throughput screening.

Structure & Knowledge Injection into Machine Learning Lab, Seoul National University   **May 2024 – Sep 2024**
Undergraduate Researcher (advisor: Jay-Yoon Lee)   *Seoul, South Korea*

- Implemented a joint-loss for semi-supervised training in RoseTTAFold2NA, enabling use of unlabeled sequences alongside labeled data; integrated the loss into the training loop (dataloaders/optimizer flow), refactored code for unlabeled batches; validated functionality with ablations across three label-density regimes, confirming stable learning signals.

Systems Pharmacology Lab, Seoul National University   **Jun 2023 – Jul 2023**
Undergraduate Internship (advisor: Minsoo Noh)   *Seoul, South Korea*

- Performed a HaCaT cell–based PGE_2 competitive ELISA to assess tryptophol's anti-inflammatory effects; benchmarked against NSAIDs, analyzed dose–response data.

TECHNICAL SKILLS

Programming & Data: Python, PyTorch, Numpy, Bash, pandas, matplotlib, Streamlit, Nginx
Modeling & Docking: RDKit, PyMOL, Chimera, AutoDock, PyRosetta, RFdiffusion (AA), LigandMPNN, AlphaFold3
Systems & DevOps: Linux, Git, Slurm, conda/mamba, HuggingFace
Experimental Techniques: cell culture (HaCaT), buffer/reagent prep, competitive ELISA, serial dilutions, plate reader

OTHER EXPERIENCE

Seoul National University Hospital   **Dec 2024 – Feb 2025**
Hospital Pharmacy Practicum   *Seoul, South Korea*

- Dispensing, patient counseling, medication safety workflow.

E-Blue Pharmacy   **Feb 2025 – Mar 2025**
Community Pharmacy Practicum   *Seoul, South Korea*

- Community dispensing, OTC counseling, inventory coordination.

Military Service   **Aug 2025 – Feb 2027 (Expected)**
Sergeant   *III Corps, Republic of Korea Army*

- Operated and maintained portable surface-to-air missile systems during air-defense training and readiness operations.

Leadership / Extracurricular

SNU Alpha | Deep Learning Study Club   **Spring 2022 – Winter 2024**
Executive Member, Co-Founder   *College of Pharmacy, Seoul National University*
- Peer-taught deep learning basics and applications in drug discovery.
- Led weekly study sessions on Natural Language Processing in Fall 2023 and PyTorch in Spring 2024.

SNU Boncho | Pharmacy Student–Alumni Association   **Spring 2022 – Winter 2024**
Executive Member   *College of Pharmacy, Seoul National University*
- Facilitated intergenerational networking among pharmacy students, alumni, and faculty.
- Organized informal gatherings and mentorship sessions bridging undergraduate and professional members.
- Supported planning of alumni events and student outreach activities.

Awards & Funding

Research Excellence Award, 2024 SNU Student-Directed Education Undergraduate Research Program   **2025**
President of Seoul National University
- Awarded to two projects per fields (ten total) for excellence in research execution and outcomes.

2024 SNU Student-Directed Education Undergraduate Research Program   **2024**
Faculty of Liberal Education, Seoul National University
- Selected as one of 36 projects to receive funding for undergraduate research.

Papers and Presentations

[1] PREpiBind: Protein Representation-integrated Epitope-MHC Class II Binding Prediction
David Hyunyoo Jang, Dongwoo Kim, Byungho Park, Untaek Hwang, Yoonjoo Choi, Juyong Lee
KIDDS 2025 Summer Workshop (Korean In silico bioDesign and Discovery Society, Poster)
Manuscript in preparation

[2] Large Language Models Pass the Korean Pharmacist Licensing Examination: A Benchmarking Study
David Hyunyoo Jang, Juyong Lee
Under review

[3] DeepXeno: Structure-Informed Prediction of Xenotransplantation Immunogenicity
David Hyunyoo Jang, Byungho Park, Untaek Hwang, Juyong Lee
Outstanding Research Presentation in 2024 SNU Student-Directed Education Undergraduate Research Program (Oral)