Jun Hyeong Kim

Seoul, South Korea

+82 10-9372-5342 tommykim0906@kaist.ac.kr github.com/Jun-Hyeong-Kim jun-hyeong-kim.github.io

Education

Korea Advanced Institute of Science and Technology — Seoul, South Korea
Ph.D. Candidate, KAIST AI — *March 2026 – Present*

- **Advisor**: Sung Ju Hwang

Bio-MAX/N-Bio, Seoul National University — Seoul, South Korea
Research Assistant — *September 2024 – July 2025*

Seoul National University — Seoul, South Korea
M.S., Interdisciplinary Program in Artificial Intelligence — *September 2022 – August 2024*

- **MS Thesis**: In silico prioritizing system for phenotype-related genes from mouse KO event using PU learning on biological network
- **Advisor**: Sun Kim

Yonsei University — Seoul, South Korea
B.S., Biotechnology — *March 2016 – August 2022*

Publications

Kim Y. Y. *et al.*, Cytosolic CRY1 Orchestrates Mitochondrial Fitness for Bioenergetic Flexibility. *(Under review)*

Kim J., Kim D., Piao Y., & Hwang S. J., AdaPath: query-adaptive path-finding via path-bank for multi-hop implicit biomedical KGQA. *EMNLP 2026 Main Conference*

*Ha S., *__Kim J.__, Piao Y., & Kim S., MV-CLAM: multi-view molecular interpretation with cross-modal projection via language model. *EMNLP 2025 Findings*

*__Kim J.__, *Koo B., & Kim S., PONYTA: prioritization of phenotype-related genes from mouse KO events using PU learning on a biological network. *Bioinformatics 2024*

Project Experience

K-Fold: Protein Structure Prediction Model
Section Lead (Sequence Foundation Model) — *November 2025 – Present*

- KAIST-led large-scale research initiative for building a next-generation biological foundation model (K-Fold)
- Leading the development of a unified foundation model to obtain high-quality embeddings for genes, proteins, and small molecules

Knowledge Graph–Augmented Retrieval for Biological Reasoning with LLMs
Research Lead — *June 2025 – Present*

- Conducting research on retrieval-augmented generation (RAG) to enhance biological reasoning of large language models
- Integrating graph-derived evidence with LLMs to support biologically grounded inference

Molecule description generation using multi-dimension structural information
Team Leader *March 2024 – May 2025*

- Project in Creative and Independent AI Research course of Interdisciplinary Program in Artificial Intelligence
- Integrating both 3D and 2D molecule structural representation as a text-space aligned information for language model with a novel cross-modal projector
- Registered the copyright for the developed model framework (MVCLAM)

Phenotype-related gene prioritization for mouse gene knockout
Team Leader *November 2023 – August 2024*

- Prioritized genes associated with phenotypic outcomes in gene knockout events.
- Applied PU learning on biological networks, using a subset of DEG and NP genes as positive inputs to rank unlabeled genes based on their phenotypic relevance.
- Leveraged gene expression changes and the topological structure of gene interaction networks to effectively identify phenotype-related genes.

CRY1: Mitochondria Quality Controller
Team Member *October 2023 – December 2023*

- Collaborative project with Laboratory of Adipocyte and Metabolism Research
- Research on novel function of Cry1 gene in mitochondria morphology and heat generation in BAT
- Identification of genes related to Cry1 gene via gene prioritization method

Diagnosis of Prostate Cancer Patients via Odorant Receptor
Team Member *February 2023 – December 2023*

- Collaborative project with Receptor Convergence Technology Laboratory
- Classification on fluorescence data from odorant receptors for accurate prostate cancer diagnosis
- Identification of optimal odorant receptor combinations and classification using multiple machine learning algorithms

Jump AI 2023
Team Member *August 2023 – September 2023*

- AI Drug Development Competition hosted by Dacon
- Prediction on compound metabolism stability using 3,498 data points
- Ranked in the top 5%

Internships

Korea Advanced Institute of Science and Technology Seoul, South Korea
Research Intern, KAIST AI *August 2025 – Present*

- **Advisor**: Sung Ju Hwang

Bio & Health Informatics Lab Seoul National University
Undergraduate Researcher *June 2022 – August 2022*

- Advisor: Sun Kim
- Analysis of ADMET biochemical data acquisition and dataset evaluation

NetBio Lab Yonsei University
Undergraduate Researcher *December 2021 – May 2022*

- Advisor: Insuk Lee
- Pangenome components analysis using classification tools for identification of persistent, shell, cloud genomes

Stem Cell & Biomaterial Engineering Lab Yonsei University
Undergraduate Researcher *June 2021 – November 2021*

- Advisor: Seung Woo Cho
- Enhancing the vascularization and maturation of brain organoids

Teaching Experience

Seoul National University — Seoul, South Korea
Teaching Assistant — *September 2024 – Present*
Computer Convergence Application (CCA)

- Delivered lecture and led assignment on Python & PyTorch Tutorial and Decision Tree algorithm

Seoul National University — Seoul, South Korea
Teaching Assistant — *March 2024 – June 2024*
Introduction to IT for Bioinformatics

- Conducted grading for midterm and final exams and managed student inquiries

AI Institute of Seoul National University, AIIS — Seoul, South Korea
Lead Teaching Assistant — *September 2023 – December 2023*
AI-BIO Research Personnel Training Program

- Assisted in the preparation and delivery of lectures on the following topics: *Life Sciences*, *Drug Development*, *Basics of Artificial Intelligence*, *Bioinformatics*, *AI-Driven Drug Development*

Seoul National University — Seoul, South Korea
Teaching Assistant — *September 2023 – December 2023*
Computer Convergence Application (CCA)

- Delivered lecture and led assignment on Decision Tree algorithm

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Awards & Scholarships

Research Achievement Scholarship - *$2,222* — Seoul National University, 2024-08
Interdisciplinary Program in Artificial Intelligence
Academic Excellence Award — Yonsei University, 2021-08
Academic Excellence Scholarship - *$3,250* — Yonsei University, 2021-08
Cheongwoo Scholarship
Academic Excellence Award — Yonsei University, 2021-02
Academic Excellence Scholarship - *$2,165* — Yonsei University, 2021-02
Jinri Scholarship
Academic Excellence Scholarship - *$925* — Yonsei University, 2021-02
Geonseon Scholarship
Honors Award — Yonsei University, 2020-08
