HANNAH KIM, M.S.

Temple University ⋄ 1925 N 12th St, Room 643, Philadelphia, PA 19122

hannah.kim0007@temple.edu ⋄ hk.garnet@gmail.com

website: hannahkimincompbio.github.io

WHO AM I?

- A passionate bioinformatician with 3+ experience in evolutionary genomics and 3+ experience in cancer research.

- Initiated and facilitated interdisciplinary collaborations with hospitals and cancer centers.

- Interested in the interface of computational biology and medicine: method development and evolutionary genomics.

- An avid learner and open-source enthusiast.

EDUCATION

PhD in Bioinformatics, Temple University   2019 - present
Advisor: Dr. Sergei L Kosakovsky Pond
Dissertation Topic: PRoperty-Informed Models of Evolution (PRIME) and their applications

MS in Computational Biology, Carnegie Mellon University   2015 - 2016
Relevant Coursework: Computational Genomics, Machine Learning, and Algorithms & Advanced Data Structures

BS in Chemistry, Carnegie Mellon University   2010 - 2013
Relevant Coursework: Principles of Computing, and Modern Analytical Instructions

PROFESSIONAL EXPERIENCE

Bioinformatics Engineer   Oct 2021 - Jan 2022
Lifetime Omics   *Remote*

- Automated cutting-edge methods and analyzed COVID-19 metagenomics data in the Google Cloud environment.

- Developed detailed standard operating procedure for reproducibility.

- Took initiatives to solve problems and demonstrated dedication for the project in the startup environment.

Bioinformatics Analyst/Software Engineer   Jul 2017 - Jun 2019
Children's Hospital of Philadelphia – Kai Tan lab   *Philadelphia, PA*

- Investigated RNA-Seq and microarray data from B-Cell Acute Lymphoblastic Leukemia subtypes using differential gene expression analysis, Gene Ontology enrichment analysis, and other relevant bioinformatics methods.

- Identified cancer-specific genetic interactions that led to publications in high-impact journals.

- Facilitated communication in the interdisciplinary environment of doctors and wet-lab and dry-lab researchers.

Research Programmer   Feb 2017 - Jun 2017
Carnegie Mellon University – Russell Schwartz lab   *Pittsburgh, PA*

- Investigated clinical and genomic data to create a cancer progression analysis pipeline using machine learning.

MS Graduate Researcher   Jan 2016 - Dec 2016
Carnegie Mellon University – Ziv Bar-Joseph lab   *Pittsburgh, PA*

- Curated and analyzed single-cell gene expression data.

Post-Baccalaureate Researcher (Chemistry/Biology)   Aug 2013 - Jun 2014
Carnegie Mellon University – Drs. Fred Lanni, Aaron Mitchell, and Luisa Hiller   *Pittsburgh, PA*

- Tested various polymer surface coatings for the prevention and destruction of biofilms using red/NIR light.

Undergraduate Student Researcher (Chemistry)   Jan 2012 - Aug 2013
Carnegie Mellon University – Kevin Noonan lab   *Pittsburgh, PA*

- Characterized pyrylium and pyridinium salts by modifying functional groups.

Student Researcher (Biology)   Jun 2011 - Aug 2011
Carnegie Mellon University – 2011 Summer Research Institute   *Pittsburgh, PA*

- Analyzed interactions among three ribosomal assembly factors in *Saccharomyces cerevisiae*.
- 1 of 12 student researchers selected for the program.

PUBLICATION

[**7**] Huzar, J., **Kim, H.**, Kumar, S., Miura, S. (2022). MOCA for integrated analysis of gene expression and genetic variation in single cells. *Frontiers in Genetics*, 13:831040. doi:10.3389/fgene.2022.831040

[**6**] Ding, Y., **Kim, H.**, Madden, K., Loftus, J., Chen, G., Allen, D., Zhang, R., Xu, J., Chen, C., Xu, Y., Tasian, S., Tan, K. (2021). Network Analysis Reveals Synergistic Genetic Dependencies for Rational Combination Therapy in Philadelphia Chromosome-like Acute Lymphoblastic Leukemia. *Clinical Cancer Research*, 27(18). doi:10.1158/1078-0432.CCR-21-0553

[**5**] Tarca, A. L., Pataki, B. Á., Romero, R., Sirota, M., Guan, Y., Kutum, R., Gomez-Lopez, N., Done, B., Bhatti, G., Yu, T., Andreoletti, G., Chaiworapongsa, T., **The DREAM Preterm Birth Prediction Challenge Consortium**, Hassan, S. S., Hsu, C., Aghaeepour, N., Stolovitzky, G., Csabai, I., Costello, J. C. (2021). Crowdsourcing assessment of maternal blood multi-omics for predicting gestational age and preterm birth. *Cell Reports Medicine*, 2(6). doi:10.1016/j.xcrm.2021.100323

[**4**] Ichikawa, Y., Bruno, V. M., Woolford, C. A., **Kim, H.**, Do, E., Brewer, G., Mitchell, A. P. (2021). Environmentally contingent control of Candida albicans cell wall integrity by transcriptional regulator Cup9. *Genetics*, 218 (3). doi:10.1093/genetics/iyab075

[**3**] Tao, Y., Rajaraman, A., Cui, X., Cui, Z., Chen, H., Zhao, Y., Eaton, J., **Kim, H.**, Ma, J., Schwartz, R. (2021). Assessing the Contribution of Tumor Mutational Phenotypes to Cancer Progression Risk. *PLOS Computational Biology*, 17(3).
doi:10.1371/journal.pcbi.1008777

[**2**] He, B., Gao, P., Ding, Y., Chen, C., Chen, G., Chen, C., **Kim, H.**, Tasian, S. K., Hunger, S. P., Tan, K. (2020). Diverse noncoding mutations contribute to deregulation of cis-regulatory landscape in pediatric cancers. *Science Advances*, 6(30). doi:10.1126/sciadv.aba3064

[**In preprint**] Tao, Y., Rajaraman, A., Cui, X., Cui, Z., Eaton, J., **Kim, H.**, Ma, J., Schwartz, R. (2019). Improving personalized prediction of cancer prognoses with clonal evolution models. *bioRxiv.* doi:10.1101/761510

[**1**] Lin, C., Jain, S., **Kim, H.**, Bar-Joseph, Z. (2017). Using neural networks for reducing the dimensions of single-cell RNA-Seq data. *Nucleic Acids Research*, 45(17). doi:10.1093/nar/gkx681

PRESENTATION

Posters

- **Kim, H.***, Shank, S., Kosakovsky Pond, S. L. (2022). PRoperty Informed Models of Evolution (PRIME). Poster: The 31st KSEA Northeast Regional Conference, Hybrid.

- Hu, Y., Chen, C., Ding, Y.*, **Kim, H.**, Tan, K. (2019). Synergistic Control Genes in Cancer Gene Networks as Targets for Combination Therapy. Poster: Children's Hospital of Philadelphia Research Poster day and Scientific Symposium, Philadelphia, PA.

Talks

- **Kim, H.***, Kosakovsky Pond, S. L. (2022). PRIME Evolutionary Imputation (PREI). Flash Talk: International Conference on Intelligent Biology and Medicine, Philadelphia, PA.

AWARDS, FELLOWSHIPS, & GRANTS

2022 Selected Attendee Support, Scientists and Engineers Early Career Development Workshop

2022 KSEA Excellent Poster Award, The 31st KSEA Northeast Regional Conference

2022 CST Three-Minute Thesis Competition 2nd Place Award, Temple University (College-level)

2015 Departmental Merit Fellowship, Carnegie Mellon University

2013 Mellon College of Science Research Honors, Carnegie Mellon University

2012 Summer Undergraduate Research Fellowship, Carnegie Mellon University

TEACHING EXPERIENCE

Course Completion — Aug 2022 - Dec 2022
Temple University — *Teaching in Higher Education (EPSY-8985)*

- Developed syllabi, assignments, and assessments using the principles of integrated course design.
- Applied the current theories of teaching in different contexts.
- Used a variety of effective teaching methods to address learners universally.
- Discussed a reflective and purposeful approach to teaching with other instructors.
- This course is a pre-requisite to obtaining *Teaching in Higher Education Certificate for Graduate Students.*

Teaching Assistant — Aug 2020 - Dec 2020
Temple University — *Genomics in Medicine (BIOL-3111/5111)*

- Generated formative and summative assessment materials and provided timely feedback (Youtube/Introduction).
- Class size: 150.

Teaching Assistant — Aug 2019 - May 2020
Temple University — *Wet Lab Courses (BIOL-2112 and BIOL-1012)*

- Gave a short lecture in the beginning of every lab, monitored student performance, and provided guidance.
- Graded lab reports and generated quizzes.
- [**Spring 2020**] BIOL-1012 General Biology II was an introductory course for non-biology majors.
- [**Fall 2019**] BIOL-2112 Introduction to Cellular and Molecular Biology was a lab course for biology majors.
- Class size: 20 (x 2 sections).

Course Developer — Feb 2016 - Aug 2016
Carnegie Mellon University — *Programming for Scientists (02201/02601)*

- Generated open-source course materials (codes and instructions) with Drs. Phillip Compeau and Carl Kingsford for Go-lang beginners.

LEADERSHIP EXPERIENCE

Secretary Feb 2023 - Apr 2023
2023 KITEE-FELIX Hackathon

- Organized the hackathon in the committee meeting held regularly.
- Outreached to universities and engineer communities in the Philadelphia region.

Philadelphia Young Generation Director Jan 2023 - Apr 2023
The 32nd KSEA Northeast Regional Conference

- Planned the conference in the bi-weekly committee meeting with PIs from academia and industry.
- Operated as the public relations and promotion chief for the pre-networking event before the conference.

DEI Representative Dec 2021 - present
Temple University College of Science and Technology-Graduate Student Organization (CST-GSO)

- Identified potential DEI topics within the organization and suggested appropriate strategies.
- Facilitated the success of the yearly PhD/MS alumni panelist event with the other board members.

Student Representative Nov 2021 - present
Temple University College of Science and Technology Diversity, Equity, and Inclusion Committee

- Discussed the promotion of DEI within college at the bi-weekly committee meetings.
- Provided feedback for a wide array of DEI topics.

Vice President Sep 2021 - present
Temple University Biology Graduate Student Society (BGSS)

- Facilitated communication between the department and the graduate school.
- Led action plans to address diverse career needs within the department of biology and organized regular meetings with the graduate school directors.
- Planned and oversaw activities for departmental retreat.

COMMUNITY INVOLVEMENT

Frontiers in Oncology (2021 IF=5.738), Ad Hoc Reviewer (1x/year), *06/2022*

- Commented as a reviewer for an academic journal using my experience in cancer research and bioinformatics.

George Washington Carver Science Fair, Science Fair Judge, *03/2022, 03/2023*

- Judged science fair projects done by students in grades 6 to 12.

PROFESSIONAL MEMBERSHIPS

Korean American Society in Biotech annd Pharmaceuticals (KASBP), *10/2022-*
Korean-American Innovative Technology Engineers and Entrepreneurs (KITEE), *04/2022-*
Society for the Study of Evolution (SSE), *04/2022-*

AnitaB.org, *09/2021-*
Society for Molecular Biology and Evolution (SMBE), *01/2021-*
– **SMBE IDEA (Inclusion, Diversity, Equity and Access) Working Group**, *11/2022-*
Korean-American Scientists and Engineers Association (KSEA), *02/2020-*
Philadelphia Korean Scholars Association (PKSA), *06/2019-*

DOCTORAL COURSEWORK

Fall 2020 **Genomics and Infectious Disease Dynamics** *BIOL-5128*
Fall 2020 **Seminar: "Ecoevo discuss"** *BIOL-8210*
Fall 2020 **Applied Statistics and Data Science** *STAT-8109*
Spring 2020 **Genomics and Evolutionary Biology of Parasites** *BIOL-5241*
Spring 2020 **Data-Intensive and Cloud Computing** *CIS-5517*
Spring 2020 **Knowledge Discovery and Data Mining** *CIS-5523*
Fall 2019 **Genomics in Medicine** *BIOL-5111*
Fall 2019 **Topics in Bioinformatics** *BIOL-5466*
Fall 2019 **Seminar Biol 8210 at Center for Computational Genetics and Genomics** *BIOL-8210*

CERTIFICATES

The Inclusive STEM Teaching Project, InCLU1x *11/2022*
Business Foundations, UBCx *10/2022*
Cancer Biology Specialization (Introduction to the Biology of Cancer, Understanding Cancer Metastasis & Understanding Prostate Cancer), Coursera *09/2022*
Matrix Algebra for Engineers, Coursera *03/2022*
Viruses & How to Beat Them: Cells, Immunity, Vaccines, IsraelX *02/2022*

PERSONAL PROJECTS

Colorblindness Image Enhancer, "Most Technically Impressive" in OwlHacks 2023, *02/2023*

CODING LANGUAGES

python, R, MATLAB, bash, JavaScript, Go-lang

Last Updated – 2023-03-10.