HANNAH KIM, M.S.

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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 (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 (Chemistry/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

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 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 in 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 at the weekly meeting with the graduate school directors.
- Planned and oversaw activities for departmental retreat.

COMMUNITY INVOLVEMENT

Frontiers in Oncology, 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*

- Judged science fair projects done by students in grades 7 to 12.

DOCTORAL COURSEWORK

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

CERTIFICATES

The Inclusive STEM Teaching Project, InCLU1x *11/2022*
Business Foundations, UBCx *10/2022*
Cancer Giology Specialization, Coursera *09/2022*

Matrix Algebra for Engineers, Coursera *03/2022*
Viruses & How to Beat Them: Cells, Immunity, Vaccines, IsraelX *02/2022*

CODING LANGUAGES

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

Last Updated – 2023-01-06.