Xuan Cindy Li

Tysons Corner, VA 22102 ◆ 314-278-9855 ◆ xli1994@umd.edu

Professional Overview

Soon-to-be Ph.D in computational biology with 5 years of experience in computational cancer research. Pre doctoral visiting fellow at National Cancer Institute. Accomplished in modeling tumor evolution using multiomics data and discovery of epigenetic biomarkers for cancer treatment. Co-authored papers accepted by top journals and conferences in computational biology and cancer research. Specialize in single-cell multiomics data manipulation and integration, cancer genomics, and data mining. Extensive experience in working in multi-disciplinary environments and collaborating with wet-lab scientists and clinicians.

Accomplishments

Developed computational framework for epigenomic single-cell tumor evolution inference

- Pioneering methylation-based tumor evolution inference with the first principled distance-based computational method, Sgootr, for inferring a tumor's single-cell methylation lineage tree and jointly identifying lineage-informative methylation CpG sites that harbor changes retained along the lineage
- Pinpointing key methylation events in solid tumor metastasis across patients and cancer types, unprecedentedly elucidating the importance of inter CpG island regions in tumor evolution tracing
- Leading collaborative efforts in validating key methylation events in animal models with wet-lab scientists
- Driving development of novel statistical methods to confidently call biological signals in single-cell multiomics data

Education

Ph.D.: Computational Biology, Bioinformatics, Genomics, Expected in 12/2023
University of Maryland - College Park - College Park, MD
Co-mentored by Dr. S. Cenk Sahinalp and Dr. Stephen M. Mount

- **UMD-NCI Partnership for Integrative Cancer Research Award,** Predoctoral visiting fellow at National Cancer Institute
- **COMBINE Fellow,** Computation and Mathematics for Biological Networks, National Science Foundation-funded Research Traineeships (NRT) program in Network Biology (NSF_NRT 1632976)
- **Dean's Fellowship**
- **MOCB Summer Fellowship**

Bachelor of Arts: Biochemistry, 12/2016
Washington University in St Louis - St Louis, MO

- **Dean's List**

Published Work

Publications

- Liu, Yuelin*, **Xuan Cindy Li*,** Farid Rashidi Mehrabadi, Alejandro Schäffer, Drew Pratt, David R. Crawford, Salem Malikić, Erin K. Molloy, Vishaka Gopalan, Stephen M. Mount, Eytan Ruppin, Kenneth Aldape, S. Cenk Sahinalp. 2022. "Single-cell methylation sequencing data reveals succint metastatic migration histories and tumor progression models". *Genome Research*, 26th International Conference on Research in Computational Molecular Biology Special Issue. *To appear.*
- Azer, Erfan Sadeqi, Farid Rashidi Mehrabadi, **Xuan Cindy Li**, Salem Malikić, Alejandro A Schäffer, E Michael Gertz, Chi-Ping Day, et al. 2020. "PhISCS-BnB: A Fast Branch and Bound Algorithm for the Perfect Tumor Phylogeny Reconstruction Problem." *Bioinformatics*, Volume 36, Issue Supplement_1, July 2020, Pages i169–i176.
- Fan, Jason, **Xuan Cindy Li**, Mark Crovella, and Mark D.M. Leiserson. 2020. "Matrix (Factorization) Reloaded: Flexible Methods for Imputing Genetic Interactions with Cross-Species and Side Information." *Bioinformatics*, Volume 36, Issue Supplement_2, December 2020, Pages i866–i874.

Conference Proceeding

- Liu, Yuelin*, **Xuan Cindy Li*,** Farid Rashidi Mehrabadi, Alejandro Schäffer, Drew Pratt, David R. Crawford, Salem Malikić, Erin K. Molloy, Vishaka Gopalan, Stephen M. Mount, Eytan Ruppin, Kenneth Aldape, S. Cenk Sahinalp. 2022. "Single-cell methylation sequencing data reveals succint metastatic migration histories and tumor progression models". 26th International Conference on Research in Computational Molecular Biology. *To appear.*

Preprints

- **Li, Xuan Cindy*,** Yuelin Liu*, Farid Rashidi Mehrabadi*, Salem Malikić, Stephen Mount, Eytan Ruppin, Kenneth Aldape, S. Cenk Sahinalp. 2021. "Epigenomic Tumor Evolution Modeling with Single-Cell Methylation Data Profiling". *bioRxiv* 2021.03.22.436475; doi: https://doi.org/10.1101/2021.03.22.436475

Presentations

- **Li, Xuan Cindy,** "Harnessing methylation changes to understand tumor heterogeneity and diversity". **Genentech single-cell regulatory genomics work group** scheduled for 09/2023
- **Li, Xuan Cindy,** "A novel multiple hypothesis testing scheme for single-cell multiomi data integration in tumor phylogenies". **The Translational Genomics Research Institute (TGen)** scheduled for 08/2023
- **Li, Xuan Cindy*,** Yuelin Liu*, et al., "Single-cell methylation sequencing data reveals succint metastatic migration histories and tumor progression models". **American Association for Cancer Research Annual Meeting** 04/2023

- **Li, Xuan Cindy***, Yuelin Liu*, Farid Rashidi Mehrabadi*, et al., “Single-cell methylation profiling reveals succinct models of epigenetic tumor progression and metastatic migration”. **Cell-NCI Symposium: Beyond Cancer Genomics Toward Precision Oncology** 10/2021
- **Li, Xuan Cindy*,** Yuelin Liu*, Farid Rashidi Mehrabadi*, et al., “Epigenomic Tumor Evolution Modeling with Single-Cell Methylation Data Profiling”. **American Association for Cancer Research Annual Meeting** 04/2021

Professional Activities

Reviewing

- Protein Science
- Genome Medicine
- 28th Intelligent Systems for Molecular Biology (ISMB 2020)
- 24th, 26th, and 27th International Conference on Research in Computational Molecular Biology (RECOMB 2020, 2022, 2023)
- 10th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB 2019)

Organizing

- Co-organized the first NCI Spring School on Algorithmic Cancer Biology (SSACB 2023)

Mentoring

- Co-mentored a team of undergraduate and graduate students to carry out research on computational discovery of molecular markers for drug response in Tech+Reesearch Workshop at Technica 2018, the world's largest all-women hackathon.
- Mentored a summer intern at National Cancer Institute to conduct reach on intratumor microbiome and guided her through extensive computational and bioinformatics training.

Teaching

- BSCI 411 Bioinformatics and Integrative Genomic: Lectured and instructed 50 senior level undergraduate students. Ran and designed materials for computer lab sessions. Successfully helped students with no computational background adopt bioinformatics skills including Linux, Shell scripting, Python, R, differential expression analysis, differential gene expression analysis, principal component analysis, and network analysis.
- BSCI 423 Immunology Lab: Lectured and instructed a total of 10 senior level undergraduate students in fundamental immunology lab techniques, including immunoprecipitation, immunofluorescence microscopy, flow cytometry, ELISA, and Western blot. Supervised in-class experiment, research design, and paper discussions. Responsible for grading and providing feedbacks for exams, writing assignments, lab reports, project design, in-class participation, and presentation.
- BSCI 171 Principle of Molecular and Cellular Biology Lab: Lectured and instructed two sections, a total of 48 undergraduate students, in fundamental molecular and cellular biology techniques, including PCR, gel electrophoresis, SDS-PAGE, microscopy, miniprep, and sterile techniques. Supervised in-class experiment and research design.