
Michael Sellers Cuoco

PhD Student, Bioinformatics and Systems Biology

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Research interests

Applying genomics data science methods to uncover biological mechanisms of aging and disease.
Interested broadly in somatic mutations, repetitive DNA, and gene regulatory networks
Thesis work is focused on retrotransposon activity in the human brain.

Education

University of California, San Diego La Jolla, California
PhD in Bioinformatics and Systems Biology In Progress
Thesis Committee:
• Fred H. Gage, PhD (Chair)
• Eran A. Mukamel, PhD (Co-Chair)
• Graham McVicker, PhD
• Melissa Gymrek, PhD
• Nicholas Schork, PhD
Trinity College Hartford, Connecticut
BS in Molecular and Cellular Biology May 2016
Minor in Models and Data

Honors and Awards

NSF Graduate Research Fellowship 2022
National Science Foundation (NSF)
Spot Award 2017
Broad Institute
Beta Beta Beta National Biology Honors Society 2014
Trinity College
NESCAC Winter All-Academic Team 2014
Trinity College

Research experience

PhD Student 2020 – Present
Gage Lab, Salk Institute for Biological Studies La Jolla, California
Mukamel Lab, UC San Diego La Jolla, California
Mentors: Fred H. Gage and Eran A. Mukamel

Research Associate 2016 – 2020
Regev Lab, Broad Institute Cambridge, Massachusetts
Mentors: Aviv Regev, Benjamin Izar, Pratiksha Thakore, Yaara Oren

Undergraduate Researcher

2014 – 2016

Meyerson Lab, Dana-Farber Cancer Institute

Boston, Massachusetts

Mentors: Matthew Meyerson and Alison Taylor

Undergraduate Researcher

2013

Trinity College

Hartford, Connecticut

HHMI Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science program. (SEA-PHAGES: seaphages.org)

Research: Published

- Subramanian, A., Vernon, K. A., Zhou, Y., Marshall, J. L., Alimova, M., Arevalo, C., Zhang, F., Slyper, M., Waldman, J., Montesinos, M. S., Dionne, D., Nguyen, L. T., **Cuoco, M. S.**, Dubinsky, D., Purnell, J., Keller, K., Sturner, S. H., Grinkevich, E., Ghoshal, A., Kotek, A., Trivioli, G., Richoz, N., Humphrey, M. B., Darby, I. G., Miller, S. J., Xu, Y., Weins, A., Chloe-Villani, A., Chang, S. L., Kretzler, M., Rosenblatt-Rosen, O., Shaw, J. L., Zimmerman, K. A., Clatworthy, M. R., Regev, A., Greka, A., “Protective role for kidney TREM2high macrophages in obesity- and diabetes-induced kidney injury.” In: *Cell reports* 43 (6 May 23, 2024). DOI: 10.1016/j.celrep.2024.114253.
- Toda, T., Bedrosian, T. A., Schafer, S. T., **Cuoco, M. S.**, Linker, S. B., Ghassemzadeh, S., Mitchell, L., Whiteley, J. T., Novaresi, N., McDonald, A. H., Gallina, I. S., Yoon, H., Hester, M. E., Pena, M., Lim, C., Suljic, E., Mansour, A. A., Boulard, M., Parylak, S. L., Gage, F. H., “Long interspersed nuclear elements safeguard neural progenitors from precocious differentiation.” In: *Cell reports* 43 (2 Feb. 13, 2024). DOI: 10.1016/j.celrep.2024.113774.
- Boyle, E. A., Goldberg, G., Schmok, J. C., Burgado, J., Layng, F. I., Grunwald, H. A., Balotin, K. M., **Cuoco, M. S.**, Chang, K.-C., Ecklu-Mensah, G., Arakaki, A. K. S., Ahmed, N., Arceo, X. G., Jagannatha, P., Pekar, J., Iyer, M., Yeo, G. W., “Junior scientists spotlight social bonds in seminars for diversity, equity, and inclusion in STEM.” In: *PloS one* 18 (11 Nov. 2023). DOI: 10.1371/journal.pone.0293322.
- Otto, J. E., Ursu, O., Wu, A. P., Winter, E. B., **Cuoco, M. S.**, Ma, S., Qian, K., Michel, B. C., Buenrostro, J. D., Berger, B., Regev, A., Kadoch, C., “Structural and functional properties of mSWI/SNF chromatin remodeling complexes revealed through single-cell perturbation screens.” In: *Molecular cell* 83 (8 Apr. 2023). DOI: 10.1016/j.molcel.2023.03.013.
- Shih, J., Sarmashghi, S., Zhakula-Kostadinova, N., Zhang, S., Georgis, Y., Hoyt, S. H., **Cuoco, M. S.**, Gao, G. F., Spurr, L. F., Berger, A. C., Ha, G., Rendo, V., Shen, H., Meyerson, M., Cherniack, A. D., Taylor, A. M., Beroukhi, R., “Cancer aneuploidies are shaped primarily by effects on tumour fitness.” In: *Nature* 619 (7971 June 29, 2023). DOI: 10.1038/s41586-023-06266-3.
- Eraslan, G., Drokhyansky, E., Anand, S., Fiskin, E., Subramanian, A., Slyper, M., Wang, J., Wittenberghe, N. V., Rouhana, J. M., Waldman, J., Ashenberg, O., Lek, M., Dionne, D., Win, T. S., **Cuoco, M. S.**, Kuksenko, O., Tsankov, A. M., Branton, P. A., Marshall, J. L., Greka, A., Getz, G., Segrè, A. V., Aguet, F., Rozenblatt-Rosen, O., Ardlie, K. G., Regev, A., “Single-nucleus cross-tissue molecular reference maps toward understanding disease gene function.” In: *Science (New York, N.Y.)* 376 (6594 May 14, 2022). DOI: 10.1126/science.ab14290.
- Hwang, W. L., Jagadeesh, K. A., Guo, J. A., Hoffman, H. I., Yadollahpour, P., Reeves, J. W., Mohan, R., Drokhyansky, E., Wittenberghe, N. V., Ashenberg, O., Farhi, S. L., Schapiro, D., Divakar, P., Miller, E., Zollinger, D. R., Eng, G., Schenkel, J. M., Su, J., Shiau, C., Yu, P., Freed-Pastor, W. A., Abbondanza, D., Mehta, A., Gould, J., Lambden, C., Porter, C. B. M., Tsankov, A., Dionne, D., Waldman, J., **Cuoco, M. S.**, Nguyen, L., Delorey, T., Phillips, D., Barth, J. L., Kem, M., Rodrigues, C., Ciprini, D., Roldan, J., Zelga, P., Jorgji, V., Chen, J. H., Ely, Z., Zhao, D., Fuhrman, K., Fropp, R., Beechem, J. M., Loeffler, J. S., Ryan, D. P., Weekes, C. D., Ferrone, C. R., Qadan, M., Aryee, M. J., Jain, R. K., Neuberg, D. S., Wo, J. Y., Hong, T. S., Xavier, R., Aguirre, A. J., Rozenblatt-Rosen, O., Mino-Kenudson, M., Castillo, C. F.-D., Liss,

- A. S., Ting, D. T., Jacks, T., Regev, A., “Single-nucleus and spatial transcriptome profiling of pancreatic cancer identifies multicellular dynamics associated with neoadjuvant treatment.” In: *Nature genetics* 54 (8 July 29, 2022). DOI: 10.1038/s41588-022-01134-8.
- Li, J., Pinto-Duarte, A., Zander, M., **Cuoco, M. S.**, Lai, C.-Y., Osteen, J., Fang, L., Luo, C., Lucero, J. D., Gomez-Castanon, R., Nery, J. R., Silva-Garcia, I., Pang, Y., Sejnowski, T. J., Powell, S. B., Ecker, J. R., Mukamel, E. A., Behrens, M. M., “Dnmt3a knockout in excitatory neurons impairs postnatal synapse maturation and increases the repressive histone modification H3K27me3.” In: *eLife* 11 (May 24, 2022). DOI: 10.7554/eLife.66909.
- Bi, K., He, M. X., Bakouny, Z., Kanodia, A., Napolitano, S., Wu, J., Grimaldi, G., Braun, D. A., **Cuoco, M. S.**, Mayorga, A., DelloStritto, L., Bouchard, G., Steinharter, J., Tewari, A. K., Vokes, N. I., Shannon, E., Sun, M., Park, J., Chang, S. L., McGregor, B. A., Haq, R., Denize, T., Signoretti, S., Guerriero, J. L., Vigneau, S., Rozenblatt-Rosen, O., Rotem, A., Regev, A., Choueiri, T. K., Allen, E. M. V., “Tumor and immune reprogramming during immunotherapy in advanced renal cell carcinoma.” In: *Cancer cell* 39 (5 Mar. 13, 2021). DOI: 10.1016/j.ccell.2021.02.015.
- Frangieh, C. J., Melms, J. C., Thakore, P. I., Geiger-Schuller, K. R., Ho, P., Luoma, A. M., Cleary, B., Jerby-Arnon, L., Malu, S., **Cuoco, M. S.**, Zhao, M., Ager, C. R., Rogava, M., Hovey, L., Rotem, A., Bernatchez, C., Wucherpfennig, K. W., Johnson, B. E., Rozenblatt-Rosen, O., Schadendorf, D., Regev, A., Izar, B., “Multimodal pooled Perturb-CITE-seq screens in patient models define mechanisms of cancer immune evasion.” In: *Nature genetics* 53 (3 Mar. 2021). DOI: 10.1038/s41588-021-00779-1.
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- Drokhlyansky, E., Smillie, C. S., Wittenberghe, N. V., Ericsson, M., Griffin, G. K., Eraslan, G., Dionne, D., **Cuoco, M. S.**, Goder-Reiser, M. N., Sharova, T., Kuksenko, O., Aguirre, A. J., Boland, G. M., Graham, D., Rozenblatt-Rosen, O., Xavier, R. J., Regev, A., “The Human and Mouse Enteric Nervous System at Single-Cell Resolution.” In: *Cell* 182 (6 Sept. 2020). DOI: 10.1016/j.cell.2020.08.003.
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Research: Preprint

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Mentorship

Joelle Faybishenko	Fall 2022 – present
Undergraduate Student, UC San Diego <i>Gage Lab, Salk Institute for Biological Studies</i>	La Jolla, California
Evan Lee	Fall 2022 – present
Undergraduate Student, UC San Diego <i>Biology Undergraduate and Master’s Mentorship,</i>	La Jolla, California
Rohini Gadde	Fall 2021 – present
Undergraduate Student, UC San Diego <i>Mukamel Lab, UC San Diego</i>	La Jolla, California
Anise Porter	Fall 2020 – present
Undergraduate Student, UC San Diego <i>Biology Undergraduate and Master’s Mentorship,</i>	La Jolla, California
Jesslyn Goh	Fall 2019 – 2020
Undergraduate Student, Wellesley College <i>Regev Lab, Broad Institute</i>	Cambridge, Massachusetts
Current: Masters Student, Harvard University	Boston, Massachusetts

Teaching

Bootcamp instructor	Fall 2021, Fall 2022
<i>Bioinformatics and Systems Biology, UCSD</i>	La Jolla, California
Teaching assistant	Spring 2015
<i>Department of Biology, Trinity College</i> BIOL 224: Genetics	Hartford, Connecticut
Tutor	2014 – 2016
<i>Department of Biology, Trinity College</i> BIOL 182: Evolution of Life BIOL 183: Cellular Basis of Life BIOL 224: Genetics	Hartford, Connecticut

Service / Outreach

Committee Member	2021 – Present
<i>Advisory Committee on Diversity</i>	La Jolla, California

Salk Institute for Biological Studies

Director of Onboarding	2021 – Present
Symposium Organizer	2022
<i>Graduate Bioinformatics Council</i>	La Jolla, California
<i>UCSD Bioinformatics and Systems Biology</i>	

Committee Member	2020 – Present
<i>Diversity Equity and Inclusion Committee</i>	La Jolla, California
<i>UCSD Bioinformatics and Systems Biology</i>	

Seminar Organizer	2021
Symposium Organizer	Fall 2021
<i>Diversity and Science Lecture Series</i>	La Jolla, California
<i>UCSD</i>	

Volunteer - High Tech High Mesa	Fall 2021
Volunteer - La Jolla High School	Fall 2021
<i>SciChats@Salk Education Outreach</i>	La Jolla, California
<i>Salk Institute for Biological Studies</i>	

Proficiencies / Skills

Programming Languages

R, Python, Bash