

Michael Sellers Cuoco

PhD Student, Bioinformatics and Systems Biology

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Research interests

Retrotransposon activity in the developing, aging, and diseased 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., Beroukhim, 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., Fropf, 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.
- He, M. X., **Cuoco, M. S.**, Crowdis, J., Bosma-Moody, A., Zhang, Z., Bi, K., Kanodia, A., Su, M.-J., Ku, S.-Y., Garcia, M. M., Sweet, A. R., Rodman, C., DelloStritto, L., Silver, R., Steinharter, J., Shah, P., Izar, B., Walk, N. C., Burke, K. P., Bakouny, Z., Tewari, A. K., Liu, D., Camp, S. Y., Vokes, N. I., Salari, K., Park, J., Vigneau, S., Fong, L., Russo, J. W., Yuan, X., Balk, S. P., Beltran, H., Rozenblatt-Rosen, O., Regev, A., Rotem, A., Taplin, M.-E., Allen, E. M. V., “Transcriptional mediators of treatment resistance in lethal prostate cancer.” In: *Nature medicine* 27 (3 Mar. 2021). DOI: 10.1038/s41591-021-01244-6.
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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

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

Salk Institute for Biological Studies

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

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

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

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| 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