Michael Sellers Cuoco

PhD Student, Bioinformatics and Systems Biology

Curriculum Vitae
Updated September 12 2020

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Education

May 2016–May 2018 **Postbaccalaureate coursework** Cambridge, Massachusetts
Harvard Extension School

Sep 2012–May 2016 **BS in Cellular and Molecular Biology** Hartford, Connecticut
Trinity College

- Minor: Models and Data
- Major GPA: 3.62

Honors and Awards

2017 **Spot Award** Cambridge, Massachusetts
Broad Institute

- Awarded to nominees to acknowledge and demonstrate appreciation and recognition for their exceptional contributions.

2014 **TriBeta National Biology Honors Society** Hartford, Connecticut
Trinity College

- Dedicated to improving the understanding and appreciation of biological study and extending boundaries of human knowledge through scientific research. Members must meet the national membership criteria.

2014 **NESCAC Winter All-Academic Team** Hartford, Connecticut
Trinity College

- Student-athletes must have reached sophomore academic standing, and be in good standing in their sport with a cumulative grade point average of at least 3.50.

Experience

Aug 2016–Aug 2020 **Research Associate** Cambridge, Massachusetts
Aviv Regev Lab, Broad Institute, MIT & Harvard University

- Collaborated with teams of physicians and scientists to characterize signatures of cancer drug resistance by single-cell and bulk transcriptome and chromatin profiling of patient, mouse, and cell line samples. Conducted functional investigation by pooled genetic perturbation experiments.

May 2014–Aug 2015 **Undergraduate Student** Boston, Massachusetts
Matthew Meyerson Lab, Dana-Farber Cancer Institute, Harvard Medical School

- Undergraduate thesis: Engineered an in vitro model of chromosome arm 8p loss by CRISPR/Cas9 editing and artificial telomere recombination to investigate the functional consequences of the common cancerous alteration.

Sep 2012–Dec 2013 **Undergraduate Student** Hartford, Connecticut
SEA-PHAGES, Genomics Research Program, Trinity College

Jun 2011–Jul 2011 **High school Student** Boston, Massachusetts
Alan D'Andrea Lab, Dana-Farber Cancer Institute, Harvard Medical School

Professional Training

2018 **Harvard Biotech Incubator** Boston, Massachusetts
Harvard Biotech Club
- ➤ Worked directly with company founding members and key opinion leaders, performing due diligence and market research to identify clinical indications for therapeutic technology.

2018 **Patent Law Short Course** Boston, Massachusetts
Harvard Biotech Club
- ➤ Reviewed basic concepts of patent law through weekly case readings and workshops at a local firm.

2017 **Heatlhcare Innovation & Commercialization Short Course** Boston, Massachusetts
Harvard Biotech Club
- ➤ Weekly modules addressed various aspects of the commercialization process of biomedical technology including intellectual property, market sizing, clinical paths, and FDA regulation.

Teaching

2018 **CodeRATS** Cambridge, Massachusetts
Broad Institute
- ➤ Managed the leadership team for a series of institute-wide introduction to programming workshops.

2015-2016 **Teaching Assistant** Hartford, Connecticut
Trinity College
- ➤ Hosted study sessions on topics in genetics

2015-2016 **Tutor** Hartford, Connecticut
Trinity College
- ➤ Tutored biology and genetics students one-on-one by request

Authored Publications

Published

Sep 6, 2020 **The Human and Mouse Enteric Nervous System at Single-Cell Resolution.**
E Drokhlyansky, CS Smillie, N Van Wittenberghe, M Ericsson, GK Griffin, G Eraslan, D Dionne, MS Cuoco, MN Goder-Reiser, T Sharova, O Kuksenko, AJ Aguirre, GM Boland, D Graham, O Rozenblatt-Rosen, RJ Xavier, A Regev
Cell doi.org/10.1016/j.cell.2020.08.003

Jul 30, 2020 **Acquired FGFR and FGF alterations confer resistance to estrogen receptor (ER) targeted therapy in ER+ metastatic breast cancer.**
P Mao, O Cohen, KJ Kowalski, J Kusiel, JE Buendia-Buendia, MS Cuoco, P Exman, SA Wander, AG Waks, U Nayar, JH Chung, SS Freeman, O Rozenblatt-Rosen, VA Miller, F Piccioni, DE Root, A Regev, EP Winer, NU Lin, N Wagle
Clinical cancer research : an official journal of the American Association for Cancer Research doi.org/10.1158/1078-0432.CCR-19-3958

Jun 24, 2020 **A single-cell landscape of high-grade serous ovarian cancer.**
B Izar, I Tirosh, EH Stover, I Wakiro, MS Cuoco, I Alter, C Rodman, R Leeson, MJ Su, P Shah, M Iwanicki, SR Walker, A Kanodia, JC Melms, S Mei, JR Lin, CBM Porter, M Slyper, J Waldman, L Jerby-Arnon, O Ashenberg, TJ Brinker, C Mills, M Rogava, S Vigneau, PK Sorger, LA Garraway, PA Konstantinopoulos, JF Liu, U Matulonis, BE Johnson, O Rozenblatt-Rosen, A Rotem, A Regev
Nature medicine doi.org/10.1038/s41591-020-0926-0

Dec 5, 2019 **IL-33 Signaling Alters Regulatory T Cell Diversity in Support of Tumor Development.**
A Li, RH Herbst, D Canner, JM Schenkel, OC Smith, JY Kim, M Hillman, A Bhutkar, MS Cuoco, CG Rappazzo, P Rogers, C Dang, L Jerby-Arnon, O Rozenblatt-Rosen, L Cong, M Birnbaum, A Regev, T Jacks
Cell reports doi.org/10.1016/j.celrep.2019.10.120

Dec 12, 2018 **Acquired HER2 mutations in ER+ metastatic breast cancer confer resistance to estrogen receptor-directed therapies.**
U Nayar, O Cohen, C Kapstad, MS Cuoco, AG Waks, SA Wander, C Painter, S Freeman, NS Persky, L Marini, K Helvie, N Oliver, O Rozenblatt-Rosen, CX Ma, A Regev, EP Winer, NU Lin, N Wagle
Nature genetics doi.org/10.1038/s41588-018-0287-5

Nov 6, 2018 **A Cancer Cell Program Promotes T Cell Exclusion and Resistance to Checkpoint Blockade.**
L Jerby-Arnon, P Shah, MS Cuoco, C Rodman, MJ Su, JC Melms, R Leeson, A Kanodia, S Mei, JR Lin, S Wang, B Rabasha, D Liu, G Zhang, C Margolais, O Ashenberg, PA Ott, EI Buchbinder, R Haq, FS Hodi, GM Boland, RJ Sullivan, DT Frederick, B Miao, T Moll, KT Flaherty, M Herlyn, RW Jenkins, R Thummalapalli, MS Kowalczyk, I Cañadas, B Schilling, ANR Cartwright, AM Luoma, S Malu, P Hwu, C Bernatchez, MA Forget, DA Barbie, AK Shalek, I Tirosh, PK Sorger, K Wucherpfennig, EM Van Allen, D Schadendorf, BE Johnson, A Rotem, O Rozenblatt-Rosen, LA Garraway, CH Yoon, B Izar, A Regev
Cell doi.org/10.1016/j.cell.2018.09.006

Sep 14, 2017 **The neuropeptide NMU amplifies ILC2-driven allergic lung inflammation.**
A Wallrapp, SJ Riesenfeld, PR Burkett, RE Abdulnour, J Nyman, D Dionne, M Hofree, MS Cuoco, C Rodman, D Farouq, BJ Haas, TL Tickle, JJ Trombetta, P Baral, CSN Klose, T Mahlakõiv, D Artis, O Rozenblatt-Rosen, IM Chiu, BD Levy, MS Kowalczyk, A Regev, VK Kuchroo
Nature doi.org/10.1038/nature24029

Apr 29, 2015 **Whole genome comparison of a large collection of mycobacteriophages reveals a continuum of phage genetic diversity.**
WH Pope, CA Bowman, DA Russell, D Jacobs-Sera, DJ Asai, SG Cresawn, WR Jacobs, RW Hendrix, JG Lawrence, GF Hatfull
MS Cuoco listed at co-investigator
eLife doi.org/10.7554/eLife.06416

Preprint

Sep 1, 2020 **Multi-modal pooled Perturb-CITE-Seq screens in patient models define novel mechanisms of cancer immune evasion**
CJ Frangieh, JC Melms, PI Thakore, KR Geiger-Schuller, P Ho, AM Luoma, BR Cleary, S Malu, M Cuoco, M Zhao, M Rogava, L Hovey, A Rotem, C Bernatche, KW Wucherpfennig, BE Johnson, O Rozenblatt-Rosen, D Schadendorf, A Regev, B Izar
bioRxiv doi.org/10.1101/2020.09.01.267211

Aug 25, 2020 **Single-nucleus and spatial transcriptomics of archival pancreatic cancer reveals multi-compartment reprogramming after neoadjuvant treatment**
WL Hwang, KA Jagadeesh, JA Guo, HI Hoffman, P Yadollahpour, R Mohan, E Drokhlyansky, N Van Wittenberghe, O Ashenberg, S Farhi, D Schapiro, JW Reeves, DR Zollinger, G Eng, JM Schenkel, WA Freed-Pastor, C Rodrigues, J Gould, C Lambden, C Porter, A Tsankov, D Dionne, D Abbondanza, J Waldman, MS Cuoco, L Nguyen, T Delorey, D Phillips, D Ciprani, M Kern, A Mehta, K Fuhrman, R Fropf, JM Beechem, JS Loeffler, DP Ryan, CD Weekes, DT Ting, CR Ferrone, JY Wo, TS Hong, AJ Aguirre, NA Rozen
bioRxiv doi.org/10.1101/2020.08.25.267336

Jul 1, 2020 **RAAS blockade, kidney disease, and expression of ACE2, the entry receptor for SARS-CoV-2, in kidney epithelial and endothelial cells**
A Subramanian, K Vernon, M Slyper, J Waldman, MD Luecken, K Gosik, D Dubinsky, MS Cuoco, K Keller, J Purnell, L Nguyen, D Dionne, O Rozenblatt-Rosen, A Weins, Human Cell Atlas Lung Biological Network, A Regev, A Greka
bioRxiv doi.org/10.1101/2020.06.23.167098

Jun 5, 2020 **Cycling cancer persister cells arise from lineages with distinct transcriptional and metabolic programs**
Y Oren, M Tsabar, HF Cabanos, MS Cuoco, E Zaganjor, PI Thakore, M Tabaka, CP Fulco, SA Hurvitz, DJ Slamon, G Lahav, A Hata, JS Brugge, A Regev
bioRxiv doi.org/10.1101/2020.06.05.136358

Apr 21, 2020 **Integrated analyses of single-cell atlases reveal age, gender, and smoking status associations with cell type-specific expression of mediators of SARS-CoV-2 viral entry and highlights inflammatory programs in putative target cells**
C Muus, MD Luecken, G Eraslan, A Waghray, G Heimberg, L Sikkema, Y Kobayashi, ED Vaishnav, A Subramanian, C Smillie, K Jagadeesh, ET Duong, E Fiskin, E Torlai Triglia, C Becavin, M Ansari, P Cai, B Lin, J Buchanan, S Chen, J Shu, AL Haber, H Chung, DT Montoro, T Adams, H Aliee, SJ Allon, Z Andrusivova, I Angelidis, O Ashenberg, K Bassler, C Becavin, I Benhar, J Bergenstrahle, L Bergenstrahle, L Bolt, E Braun, LT Bui, M Chaffin, E Chichelnitskiy, J Chiou, TM Conlon, MS Cuoco, M Deprez, NA Fisc
bioRxiv doi.org/10.1101/2020.04.19.049254

Mar 20, 2020 **Transcriptional mediators of treatment resistance in lethal prostate cancer**
MX He, MS Cuoco, J Crowdis, A Bosma-Moody, Z Zhang, K Bi, A Kanodia, M-J Su, C Rodman, L DelloStritto, P Shah, KP Burke, B Izar, Z Bakouny, AK Tewari, D Liu, SY Camp, NI Vokes, J Park, S Vigneau, L Fong, O Rozenblatt-Rosen, A Regev, A Rotem, M-E Taplin, EM Van Allen
bioRxiv doi.org/10.1101/2020.03.19.998450

Oct 21, 2019 **Pan-cancer single cell RNA-seq uncovers recurring programs of cellular heterogeneity**
GS Kinker, AC Greenwald, R Tal, Z Orlova, MS Cuoco, JM McFarland, A Warren, C Rodman, JA Roth, SA Bender, B Kumar, JW Rocco, PA Fernandes, CC Mader, H Keren-Shaul, A Plotnikov, H Barr, A Tsherniak, O Rozenblatt-Rosen, V Krizhanovsky, SV Puram, A Regev, I Tirosh
bioRxiv doi.org/10.1101/807552

Oct 7, 2019 **Acquired FGFR and FGF alterations confer resistance to estrogen receptor (ER) targeted therapy in ER+ metastatic breast cancer**
P Mao, O Cohen, KJ Kowalski, JG Kusiel, JE Buendia-Buendia, MS Cuoco, P Exman, SA Wander, AG Waks, U Nayar, J Chung, S Freeman, O Rozenblatt-Rosen, VA Miller, F Federica Piccioni, DE Root, A Regev, EP Winer, NU Lin, N Wagle
bioRxiv doi.org/10.1101/605436

Sep 4, 2019 **The enteric nervous system of the human and mouse colon at a single-cell resolution**
E Drokhlyansky, CS Smillie, N Van Wittenberghe, M Ericsson, GK Griffin, D Dionne, MS Cuoco, MN Goder-Reiser, T Sharova, AJ Aguirre, GM Boland, D Graham, O Rozenblatt-Rosen, RJ Xavier, A Regev
bioRxiv doi.org/10.1101/746743

Aug 4, 2019 **Opposing immune and genetic forces shape oncogenic programs in synovial sarcoma**
L Jerby, C Neftel, ME Shore, MJ McBride, B Haas, B Izar, HR Weissman, A Volorio, G Boulay, L Cironi, AR Richman, LC Broye, JM Gurski, CC Luo, R Mylvaganam, L Nguyen, S Mei, Jc Melms, C Georgescu, O Cohen, JE Buendia-Buendia, MS Cuoco, D Labes, DR Zollinger, JM Beechem, P Nielsen, I Chebib, G Cote, E Choy, I Letovanec, S Cherix, N Wagle, PK Sorger, AB Haynes, JT Mullen, I Stamenkovic, MN Rivera, C Kadoch, O Rozenblatt-Rosen, ML Suva, N Riggi, A Regev
bioRxiv doi.org/10.1101/724302

Jan 6, 2019 **Longitudinal single cell profiling of regulatory T cells identifies IL-33 as a driver of tumor immunosuppression**
A Li, RH Herbst, D Canner, JM Schenkel, OC Smith, JY Kim, M Hillman, A Bhutkar, MS Cuoco, CG Rappazzo, P Rogers, CQ Dang, O Rozenblatt-Rosen, L Cong, M Birnbaum, A Regev, T Jacks
bioRxiv doi.org/10.1101/512905

Publications and preprints are updated programmatically.

Presentations

Talks

Apr 2020 **The cellular origins of drug resistance in cancer**
Regev Lab Staff Meeting; Cambridge, Massachusetts

Oct 2018 **CRISPR screening for regulators of cancer immune checkpoint inhibitor resistance**
Regev Lab Science Days Retreat; Cambridge, Massachusetts

May 2017 **Understanding the mechanisms of drug resistance in melanoma**
Regev Lab Staff Meeting; Cambridge, Massachusetts

May 2016 **In vitro modeling and analysis of chromosome 8p arm-level deletion using CRISPR-Cas9.**
Trinity College Biology Department; Hartford, Connecticut

Aug 2015 **In vitro modeling and analysis of chromosome 8p arm-level deletion using CRISPR-Cas9.**
Meyerson Lab Group Meeting; Boston, Massachusetts

Aug 2014 **Genome engineering to generate models of chromosome arm-level aneuploidies.**
Meyerson Lab Group Meeting; Boston, Massachusetts

Nov 2012 **The role of the FANCD2 gene in Fanconi Anemia and DNA repair.**
Concord-Carlisle High School STEM series; Concord, Massachusetts

Posters

Dec 2019 **Metabolic switching underlies the ability of cancer persister cells to cycle under drug treatment.**
Annual Broad Institute Retreat; Boston, Massachusetts

Feb 2019 **Targeting the root of non-genetic cancer relapse using an expressed barcode library.**
Annual Klarman Cell Observatory Retreat; Cambridge, Massachusetts

Dec 2018 **Discovering the master regulators of immune checkpoint inhibitor resistance in melanoma with Perturb-Seq.**
Annual Broad Institute Retreat; Boston, Massachusetts

Jul 2018 **Single-cell RNA-Seq of melanoma ecosystems reveals sources of T cell exclusion linked to immunotherapy clinical outcomes.**
Annual Broad Institute-Israel Science Foundation Symposium; Cambridge, Massachusetts

Jun 2018 **The Center for Cancer Precision Medicine enables exploration of immunotherapy resistance in melanoma at the single-cell level.**
Annual Dana-Farber / Harvard Cancer Center Genetics Retreat; Boston, Massachusetts

May 2016 **In vitro modeling and analysis of chromosome 8p arm-level deletion using CRISPR-Cas9.**
Trinity College Annual Spring Research Symposium; Hartford, Connecticut

May 2013 **Review of integrase-mediated site-specific recombination in mycobacteriophage species.**
Trinity College Annual Spring Research Symposium; Hartford, Connecticut

Service

2018 **Patient Ambassador** Boston, Massachusetts
Dana-Farber Cancer Institute
- ➤ Escorted patients to appointments across the Longwood Medical Area

Skills

R (advanced), Bash, Matlab, Python	Programming
tissue dissociation, cell line culture, flow cytometry	Cellular biology
plasmid cloning, CRISPR gene editing, RNA-seq, ATAC-seq	Molecular biology