Michael Sellers Cuoco

Research Associate

Aviv Regev Laboratory - Broad Institute

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Molecular biologist and bioinformatician focused on gene regulation in cancer evolution and drug resistance. Interested in decoding and modeling the human cell.

Education

Harvard Extension School — *Cambridge, Massachusetts*

Postbaccalaureate coursework — *2016-05-01–2018-05-01*

Trinity College — *Hartford, Connecticut*

BS in Cellular and Molecular Biology — *2012-09-01–2016-05-01*

- Minor: Models and Data

Honors and Awards

Broad Institute — *Cambridge, Massachusetts*

Spot Award — *2017*

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

Trinity College — *Hartford, Connecticut*

TriBeta National Biology Honors Society — *2014*

- 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.

Trinity College — *Hartford, Connecticut*

NESCAC Winter All-Academic Team — *2014*

- 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

Aviv Regev Lab | Broad Institute | MIT & Harvard — *Cambridge, Massachuseets*

Research Associate — *2016-08-01–2020-08-01*

- 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 validation primarily by in vitro by genetic perturbation experiments.

Matthew Meyerson Lab | Dana-Farber Cancer Institute | Harvard Medical School — *Boston, Massachusetts*

Undergraduate Student — *2015-05-01–2015-08-01*

- 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.

Matthew Meyerson Lab | Dana-Farber Cancer Institute | Harvard Medical School — *Boston, Massachusetts*

Undergraduate Student — *2014-05-01–2014-08-01*

SEA-PHAGES | Genomics Research Program | Trinity College — *Hartford, Connecticut*

Undergraduate Student — *2012-09-01–2013-12-01*

Alan D'Andrea Lab | Dana-Farber Cancer Institute | Harvard Medical School — *Boston, Massachusetts*

Highschool Student — *2011-06-01–2011-07-01*

Training

Harvard Biotech Club *Boston, Massachusetts*

Harvard Biotech Incubator *2018*

- Worked directly with company founding members and key opinion leaders, performing due diligence and market research to identify clinical indications for therapeutic technology.

Harvard Biotech Club *Boston, Massachusetts*

Patent Law Short Course *2018*

- Reviewed basic concepts of patent law through weekly case readings and workshops at a local firm.

Harvard Biotech Club *Boston, Massachusetts*

Heatlhcare Innovation & Commercialization Short Course *2017*

- Weekly modules addressed various aspects of the commercialization process of biomedical technology including intellectual property, market sizing, clinical paths, and FDA regulation.

Teaching

Trinity College *Hartford, Connecticut*

Tutor *2015-2016*

- Tutored struggling students one-on-one by request

Trinity College *Hartford, Connecticut*

Teaching Assistant *2015-2016*

- Hosted study sessions on topics in genetics

Broad Institute *Cambridge, Massachusetts*

CodeRATS *2018*

- Managed the leadership team for a series of institute-wide introduction to programming workshops.

Publications

Non-first author

U Nayar, O Cohen, C Kapstad, MS Cuoco, AG Waks, SA Wander, ... *Nature genetics*

Acquired HER2 mutations in ER+ metastatic breast cancer confer resistance to estrogen receptor–directed therapies *2019*

A Li, RH Herbst, D Canner, JM Schenkel, OC Smith, JY Kim, M Hillman, ... *Cell Reports*

IL-33 Signaling Alters Regulatory T Cell Diversity in Support of Tumor Development *2019*

A Li, RH Herbst, D Canner, JM Schenkel, OC Smith, JY Kim, M Hillman, ...

Longitudinal single cell profiling of regulatory T cells identifies IL-33 as a driver of tumor immunosuppression *2019*

WL Hwang, KA Jagadeesh, O Ashenberg, E Drokhlyansky, G Eng, ... *Cancer Research*

Abstract A22: Molecular subtypes and resistance programs in pancreatic ductal adenocarcinoma elucidated with single-nucleus RNA-seq *2019*

WL Hwang, K Jagadeesh, O Ashenberg, E Drokhlyansky, G Eng, ... *PANCREAS*

Dissecting Transcriptomic Heterogeneity in Patient-Derived Pancreatic Ductal Adenocarcinoma With Single-Nucleus RNA-seq *2019*

L Jerby, P Shah, MS Cuoco, C Rodman, MJ Su, JM Melms, R Leeson, ... *Cancer Immunology Research*

Abstract A082: Single-cell RNA-sequencing of metastatic melanoma identifies a cancer cell-intrinsic program associated with immune checkpoint inhibitor resistance *2019*

L Jerby-Arnon, P Shah, MS Cuoco, C Rodman, MJ Su, JC Melms, ... *Cell*

A cancer cell program promotes T cell exclusion and resistance to checkpoint blockade *2018*

A Wallrapp, SJ Riesenfeld, PR Burkett, REE Abdulnour, J Nyman, ... *The Journal of Immunology*

Single-cell RNA-seq identifies the neuropeptide NMU as a novel regulator of ILC2 function *2018*

A Wallrapp, SJ Riesenfeld, PR Burkett, REE Abdulnour, J Nyman, ... *Nature*

The neuropeptide NMU amplifies ILC2-driven allergic lung inflammation *2017*

A Wallrapp, SJ Riesenfeld, PR Burkett, RE Abdulnour, J Nyman, ... *Nature*

Erratum: The neuropeptide NMU amplifies ILC2-driven allergic lung inflammation. *2017*

Preprints

C Muus, MD Luecken, G Eraslan, A Waghray, G Heimberg, L Sikkema, ... *BioRxiv*

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 … *2020*

MX He, MS Cuoco, J Crowdis, A Bosma-Moody, Z Zhang, K Bi, A Kanodia, ... *BioRxiv*

Transcriptional mediators of treatment resistance in lethal prostate cancer *2020*

E Drokhlyansky, CS Smillie, N Van Wittenberghe, M Ericsson, GK Griffin, ... *BioRxiv*

The enteric nervous system of the human and mouse colon at a single-cell resolution *2019*

GS Kinker, AC Greenwald, R Tal, Z Orlova, MS Cuoco, JM McFarland, ... *BioRxiv*

Pan-cancer single cell RNA-seq uncovers recurring programs of cellular heterogeneity *2019*

L Jerby-Arnon, C Neftel, ME Shore, MJ McBride, B Haas, B Izar, ... *BioRxiv*

Opposing immune and genetic forces shape oncogenic programs in synovial sarcoma *2019*

Updated programmatically each week. See here for DOIs and citation details.

Presentations

Regev Lab Staff Meeting — *Cambridge, Massachusetts*
The cellular origins of drug resistance in cancer — *2020-04-01*

Annual Broad Institute Retreat — *Boston, Massachusetts*
Metabolic switching underlies the ability of cancer persister cells to cycle under drug treatment. — *2019-12-01*

Annual Klarman Cell Observatory Retreat — *Cambridge, Massachusetts*
Targeting the root of non-genetic cancer relapse using an expressed barcode library. — *2019-02-01*

Annual Broad Institute Retreat — *Boston, Massachusetts*
Discovering the master regulators of immune checkpoint inhibitor resistance in melanoma with Perturb-Seq. — *2018-12-01*

Regev Lab Science Days Retreat — *Cambridge, Massachusetts*
CRISPR screening for regulators of cancer immune checkpoint inhibitor resistance — *2018-10-01*

Annual Broad Institute-Israel Science Foundation Symposium — *Cambridge, Massachusetts*
Single-cell RNA-Seq of melanoma ecosystems reveals sources of T cell exclusion linked to immunotherapy clinical outcomes. — *2018-07-01*

Annual Dana-Farber / Harvard Cancer Center Genetics Retreat — *Boston, Massachusetts*
The Center for Cancer Precision Medicine enables exploration of immunotherapy resistance in melanoma at the single-cell level. — *2018-06-01*

Regev Lab Staff Meeting — *Cambridge, Massachusetts*
Understanding the mechanisms of drug resistance in melanoma — *2017-05-01*

Trinity College Annual Spring Research Symposium — *Hartford, Connecticut*
In vitro modeling and analysis of chromosome 8p arm-level deletion using CRISPR-Cas9. — *2016-05-02*

Trinity College Biology Department — *Hartford, Connecticut*
In vitro modeling and analysis of chromosome 8p arm-level deletion using CRISPR-Cas9. — *2016-05-01*

Meyerson Lab Group Meeting — *Boston, Massachusetts*
In vitro modeling and analysis of chromosome 8p arm-level deletion using CRISPR-Cas9. — *2015-08-01*

Meyerson Lab Group Meeting — *Boston, Massachusetts*
Genome engineering to generate models of chromosome arm-level aneuploidies. — *2014-08-01*

Trinity College Annual Spring Research Symposium — *Cambridge, Massachusetts*
Review of integrase-mediated site-specific recombination in mycobacteriophage species. — *2013-05-01*

Concord-Carlisle High School STEM series — *Concord, Massachusetts*
The role of the FANCD2 gene in Fanconi Anemia and DNA repair. — *2012-11-01*

Service

Dana-Farber Cancer Institute — *Boston, Massachusetts*
Patient Ambassador — *2018*

- Escorted patients to appointments across the Longwood Medical Area

Skills

Analytical
statistical modelling, data science, reproducible research

Programming
R (advanced), Bash, Matlab, Python

Packages
tidyverse, Rmarkdown, blogdown

Tools
Git, Docker, Travis