Andrew Butler

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Education

New York University
Ph.D. Candidate Biology *August 2015–Present*
Advisor: Rahul Satija

University of Texas at Austin
B.S. Biology Honors *August 2011–May 2015*

Research Experience

Single Cell Genomics
Advisor: Rahul Satija *May 2016 - Present*

- Currently conducting research on methods development for single-cell RNA-seq analsysis. Topics of interest include cell type identification through supervised and unsupervised analyses and methods for data integration. Also contributing as one of the lead developers to Seurat, the open source R package developed and maintained by the Satija lab.

Computational Biology
Advisor: Claus Wilke *Summer 2013 - Spring 2015*

- Conducted research focused on improving multiple protein sequence alignment. Hidden markov models were used as the basis of these alignment algorithms in order to incorporate relevant biochemical/biophysical information into the alignments. Also contributed to a collaborative project aiming to better characterize bacterial metabolism. Worked primarily with RNA-Seq data to understand tRNA gene levels

Virtual Drug Screening — Freshman Research Initiative
Advisor: Josh Beckham *Summer 2012 - Spring 2013*

- Conducted preliminary drug discovery research. A combination of wet lab techniques and virtual high throughput screening methods were used in an attempt to find inhibitors for a protein target of interest. Worked primarily on a protein critical to viability in *Plasmodium falciparum*.

Publications

1. "Toward a Common Coordinate Framework for the Human Body."
   Jennifer E. Rood, Tim Stuart*, Shila Ghazanfar*, Tommaso Biancalani*, Eyal Fisher, **Andrew Butler,** Anna Hupalowska, Leslie Gaffney, William Mauck, Gokcen Eraslan, John C.Marioni, Aviv Regev, Rahul Satija. Cell. December 2019.

2. "Comprehensive Integration of Single-Cell Data."
   Tim Stuart*, **Andrew Butler***, Paul Hoffman, Christoph Hafemeister, Efthymia Papalexi, William M Mauck III, Yuhan Hao, Marlon Stoeckius, Peter Smibert, Rahul Satija. Cell. June 2019.

3. "Integrated analysis of single cell transcriptomic data across conditions, technologies, and species." **Andrew Butler,** Paul Hoffman, Peter Smibert, Efthymia Papalexi, Rahul Satija. Nature Biotechnology. April 2018.

4. "Molecular transitions in early progenitors during human cord blood hematopoiesis." Shiwei Zheng, Efthymia Papalexi, **Andrew Butler,** William Stephenson, Rahul Satija. Molecular Systems Biology. March 2018.

5. "Developmental diversification of cortical inhibitory interneurons." Christian Mayer*, Christoph Hafemeister*, Rachel C. Bandler*, Robert Machold, Renata Batista Brito, Xavier Jaglin, Kathryn Allaway, **Andrew Butler,** Gord Fishell, Rahul Satija. Nature. March 2018.

6. "Single-Cell RNA-Seq Of Rheumatoid Arthritis Synovial Tissue Using Low Cost Microfluidic Instrumentation." William Stephenson*, Laura T Donlin*, **Andrew Butler*,** Cristina Rozo, Ali Rashidfarrokhi, Susan M Goodman, Lionel B Ivashkiv, Vivian P Bykerk, Dana E Orange, Robert B Darnell, Harold P Swerdlow, Rahul Satija. Nature Comunications. February 2018.

7. "Single-cell RNA-seq reveals new types of human blood dendritic cells, monocytes, and progenitors." Alexandra-Chloe Villani*, Rahul Satija*, Gary Reynolds, Siranush Sarkizova, Karthik Shekhar, James Fletcher, Morgane Griesbeck, **Andrew Butler,** Shiwei Zheng, Suzan Lazo, Laura Jardine, David Dixon, Emily Stephenson, Emil Nilsson, Ida Grundberg, David McDonald, Andrew Filby, Weibo Li, Philip L De Jager, Orit Rozenblatt-Rosen, Andrew A Lane, Muzlifah Haniffa, Aviv Regev, Nir Hacohen. Science. April 2017.

8. "Seq-Well: portable, low-cost RNA sequencing of single cells at high throughput." Todd M Gierahn, Marc H Wadsworth II, Travis K Hughes, Bryan D Bryson, **Andrew Butler,** Rahul Satija, Sarah Fortune, J Christopher Love, Alex K Shalek. Nature Methods. February 2017.

Teaching Experience

New York University

Recitation Leader — Statistical learning from large-scale biological data *Fall 2017, Fall 2019*

- Led a recitation help section for 10-15 graduate students. Taught introductory statistics, machine learning, and programming concepts and graded assignments.

New York University

Recitation Leader — Biostatistics *Fall 2016, Spring 2017, Fall 2018*

- Led recitation sections for the undergraduate biostatistics course. Taught introductory statistics concepts and the programming language R. Graded assignments and tests for 40+ students.

University of Texas at Austin

Peer Mentor — Freshman Research Initiative *Spring 2013 - Fall 2013*

- Worked as a peer mentor for the Freshman Research Initiative Program. Helped teach proper laboratory techniques and provided assistance and guidance to freshman students interested in research. Supervised by Dr. Josh Beckham.

University of Texas at Austin
Undergraduate Teaching Assistant — Biostatistics *Fall 2012*
- Worked as an undergraduate teaching assistant for Dr. Bindu Viswanathan's "Biostatistics" course. Graded lab and homework assignments for 20+ students. Provided assistance to students during lab time and with in-class assignments.

Selected Presentations

Stockholm, Sweden
Single Cell Genomics *September 2019*
- Presented a poster on recent improvements and developments with respect to my work on integration methods for scRNA-seq data

Keystone Symposium
Single Cell Biology *January 2019*
- Presented a workshop talk and poster on integration methods for scRNA-seq data.

New York University
NYU Biology Department Annual Retreat *September 2017*
- Presented a summary of my research on integration methods for scRNA-seq data.

University of Texas at Austin
Undergraduate Research Forum *April 2015*
- Presented a poster summarizing my undergraduate honors thesis research on RNA-seq read coverage variability in tRNA reads.

Michigan State University
BEACON Congress *August 2013*
- Presented a summary of my research related to Hidden Markov Model multiple protein sequence alignment in a short oral talk.

University of Wisconsin - La Crosse
National Conference on Undergraduate Research *April 2013*
- Presented a poster demonstrating the research done towards discovering novel inhibitors for a protein target in *Plasmodium falciparum*.

Selected Honors

Awards

- New York Genome Center Outstanding Contribution (PhD student) *2017*

Graduate Fellowships

- NSF Graduate Research Fellowship *2017*
- MacCracken Fellowship *2015*

Undergraduate Awards and Scholarships

- College Scholar *2013, 2014, 2015*
- President's Achievement Scholarship *2012, 2013, 2014, 2015*
- Phi Beta Kappa *2015*
- College of Natural Sciences Undergraduate Research Fellowship *2012*