Keshav Motwani

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Departments of Statistics and Mathematics
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Education

University of Florida, Gainesville, Florida
B.S. Statistics (*summa cum laude*), December 2021
B.S. Mathematics (*cum laude*), December 2021

Research Experience

University of Florida, Gainesville, Florida
Research Assistant, March 2020 – Present
- Advisors: Aaron J. Molstad and Rhonda Bacher
- High-dimensional integrative multinomial regression with response categories measured at different resolutions across datasets
- Application to cell type prediction for single-cell gene expression data

University of Oslo, Oslo, Norway
Research Intern, May 2019 – July 2019
- Advisors: Victor Greiff and Geir Kjetil Sandve
- Software development for immune receptor sequencing data analysis and machine learning

University of Florida, Gainesville, Florida
Research Assistant, March 2017 – March 2020
- Advisor: Todd M. Brusko
- Analysis of immune receptor sequencing and single-cell gene expression data in the context of type 1 diabetes immunology

Work Experience

10x Genomics, Pleasanton, California
Software Product Manager – Bioinformatics, August 2021 – Present

Submitted Manuscripts & Preprints

1. **Keshav Motwani**, Rhonda Bacher, and Aaron J Molstad. Binned multinomial regression with application to integrative cell type annotation. *arXiv, submitted to Annals of Applied Statistics*, 2021
2. Chakravarthi Kanduri, Milena Pavlovic, Lonneke Scheffer, **Keshav Motwani**, Maria Chernigovskaya, Victor Greiff, and Geir Kjetil Sandve. Profiling the baseline performance and limits of machine learning models for adaptive immune receptor repertoire classification. *bioRxiv, submitted to Bioinformatics*, 2021

Publications

1. Milena Pavlovic, Lonneke Scheffer, **Keshav Motwani**, Chakravarthi Kanduri, Radmila Kompova, Nikolay Vazov, Knut Waagan, Fabian LM Bernal, Alexandre Almeida Costa, Brian Corrie, and others. immuneML: an ecosystem for machine learning analysis of adaptive immune receptor repertoires. *Nature Machine Intelligence*, 2021
2. **Keshav Motwani**, Leeana D Peters, Willem H Vliegen, Ahmed Gomaa El-Sayed, Howard R Seay, M Cecilia Lopez, Henry V Baker, Amanda L Posgai, Maigan A Brusko, Daniel J Perry, and others. Human regulatory T cells from umbilical cord blood display increased repertoire diversity and lineage stability relative to adult peripheral blood. *Frontiers in Immunology*, 11:611, 2020
3. Emmi-Leena Ihantola, Henna Ilmonen, Anssi Kailaanmaki, Marja Rytkonen-Nissinen, Aurelien Azam, Bernard Maillere, Cecilia S Lindestam Arlehamn, Alessandro Sette, **Keshav Motwani**, Howard R Seay, and others. Characterization of proinsulin T

cell epitopes restricted by type 1 diabetes–associated HLA class II molecules. *The Journal of Immunology*, 204(9):2349–2359, 2020

4. Mohsen Khosravi-Maharlooei, Aleksandar Obradovic, Aditya Misra, **Keshav Motwani**, Markus Holzl, Howard R Seay, Susan DeWolf, Grace Nauman, Nichole Danzl, Haowei Li, and others. Cross-reactive public TCR sequences undergo positive selection in the human thymic repertoire. *The Journal of Clinical Investigation*, 129(6):2446–2462, 2019

Contributed Conference Presentations

1. **Keshav Motwani**, Milena Pavlovic, Geir Kjetil Sandve, Victor Greiff, and Todd M Brusko. T-cell receptor repertoires in peripheral blood encode type 1 diabetes status. In *Adaptive Immune Receptor Repertoire Community Meeting*, Genoa, Italy, May 2019
2. **Keshav Motwani**, Milena Pavlovic, Geir Kjetil Sandve, Victor Greiff, and Todd M Brusko. T-cell receptor repertoires in peripheral blood encode type 1 diabetes status. In *NIH Human Islet Research Network Annual Meeting*, Washington, DC, April 2019
3. **Keshav Motwani** and Todd M Brusko. The T cell receptor CDR3B contains sequence motifs that predict disease state in nPOD samples. In *Network for Pancreatic Organ Donors with Diabetes (nPOD) Annual Meeting*, Hollywood, FL, February 2018

Software

1. **Keshav Motwani**. *IBMR: R/C++ package for fitting the integrative binned multinomial regression model*, 2021. https://github.com/keshav-motwani/IBMR
2. **Keshav Motwani**. *MultiLORS: R/C++ package for fitting a multi-dataset version of the LORS model proposed by Yang et al.*, 2021. https://github.com/keshav-motwani/MultiLORS
3. Milena Pavlovic, Lonneke Scheffer, **Keshav Motwani**, Victor Greiff, and Geir Kjetil Sandve. *immuneML: A platform for machine learning analysis of adaptive immune receptor repertoire data*, 2021. https://github.com/uio-bmi/immuneML
4. **Keshav Motwani**. *scanalysis: Multi-sample visualization and immune repertoire analysis utilities for single-cell data*, 2019. https://github.com/keshav-motwani/scanalysis

Honors and Awards

2021	University Scholars Program ($1750) *(Department of Statistics, University of Florida)*
2020	**Goldwater Scholar** ($15000)
2019	Summer International Undergraduate Research Program ($5000) *(University of Oslo, Norway)*
2018	University Scholars Program ($1750) *(College of Medicine, University of Florida)*
2018-2021	Bright Futures Florida Academic Scholarship (full tuition)

Service

- UF Undergraduate Scholars Research Program Advisory Committee (2018-2020)
- UF American Physician Scientists Association Bioinformatics Director (2018-2020)

Skills

Advanced: R, C++, Python
Intermediate: Bash, LaTeX
Basic: MATLAB, Java