

# MATTHEW N. BERNSTEIN

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## EDUCATION

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<b>Ph.D., Computer Sciences</b> University of Wisconsin – Madison	Aug. 2019 Madison, WI
<b>M.S., Computer Sciences</b> University of Wisconsin – Madison	Dec. 2015 Madison, WI
<b>B.S. <i>Magna Cum Laude</i>, Computer Science</b> University of Notre Dame	May 2013 South Bend, IN

## WORK EXPERIENCE

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<b>Postdoctoral Fellow</b> Morgridge Institute for Research • Advised by Christina Kendzierski, Ph.D. and Ron Stewart, Ph.D.	2019 – Present Madison, WI
<b>Research Assistant</b> University of Wisconsin – Madison • Advised by Colin Dewey, Ph.D.	2014 - 2019 Madison, WI
<b>Software Development Engineering Intern</b> Amazon	Summer 2014 Seattle, WA
<b>Teaching Assistant (Lecturer)</b> University of Wisconsin – Madison	2013 - 2014 Madison, WI
<b>Software Development Engineering Intern</b> Amazon	Summer 2013 New York, NY
<b>Research Intern</b> Space and Naval Warfare Systems Command (SPAWAR)	Summer 2012 San Diego, CA

## AWARDS AND FELLOWSHIPS

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<b>NIH/BD2K Young Investigator Travel Scholarship</b> International Conference on Intelligent Systems for Molecular Biology	July 6-10, 2018 Chicago, IL
<b>Best Plenary Talk</b> National Library of Medicine Informatics Training Conference	June 6, 2017 San Diego, CA
<b>CIBM Predoctoral Fellowship</b> University of Wisconsin – Madison	2015-2018 Madison, WI
<b>University Housing Honored Instructor Award</b> University of Wisconsin – Madison	Fall 2013 Madison, WI

## PEER-REVIEWED PUBLICATIONS

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† corresponding author, ‡ co-second author

1. **Bernstein, M.N.**<sup>†</sup>, Dewey, C.N. (2021). Annotating cell types in human single-cell RNA-seq data with Cello. *STAR Protocols* (In Press).

2. Nimkulrat, S.D., **Bernstein, M.N.**, Ni, Z., Brown, J., Kendzierski, C., Blum, B. (2021). The Anna Karenina model of  $\beta$ -cell maturation in development and their dedifferentiation in type 1 and type 2 diabetes. *Diabetes* (In Press).
3. **Bernstein, M.N.**, Ni, Z., Collins, M., Burkard, M.E., Kendzierski, C., Stewart, R. (2021). CHARTS: A web application for characterizing and comparing tumor subpopulations in publicly available single-cell RNA-seq datasets. *BMC Bioinformatics*. 22(83).
4. **Bernstein, M.N.**, Ma, J., Gleicher, M., Dewey, C.N. (2021). Cello: Comprehensive and hierarchical cell type classification of human cells with the Cell Ontology. *iScience*, 24(1), 101913.
5. Overmyer, K.A., Shishkovaa, E., Miller, I.J., Balnisa, J., **Bernstein, M.N.** ‡, Peters-Clarke, T.M. ‡, Meyer, J.G. ‡, Quan, Q., Muehlbauer, L.K., Trujillo1, E.A., Hei, Y., Chopra, A., Chieng, H.C., Anupama Tiwari, A., Judson, M.A., Paulson, B., Brademan, D.R., Zhu, Y., Serrano, L.R., Linke, V., Drake, L.A., Adam, A.P., Schwartz, B.S., Singer, H.A., Swanson, S., Mosher, D.F., Stewart, R., Coon, J.J., Jaitovich, A. (2021). Large-scale Multi-omic Analysis of COVID-19 Severity. *Cell Systems*, 12(1), 23-40.
6. **Bernstein, M.N.** †, Gladstein, A., Latt, K.Z., Clough, E., Busby, B., Dillman, A. (2020). Jupyter notebook-based tools for building structured datasets from the Sequence Read Archive. *F1000Research*, 9(376).
7. **Bernstein, M.N.**, Doan, A., Dewey, C.N. (2017). MetaSRA: normalized human sample-specific metadata for the Sequence Read Archive. *Bioinformatics*, 33(18), 2914–2923.

#### SUBMITTED MANUSCRIPTS

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1. Simonett, S.P., Shin, S., Bacher, R., Dong, C., Smith, L., Rabaglia, M., Stapleton, D., Schueler, K., Choi, J., **Bernstein, M.N.**, Perez-Cervantes, C., Herring, J., Spaeth, J., Stein, R., Tessem, J., Kendzierski, C., Keles, S., Moskowitz, I., Attie, A., Keller, M. (2020). Identification of direct transcriptional targets of Nfatc2 that promote  $\beta$ -cell proliferation in human islets. Manuscript under revision at *The Journal of Clinical Investigation*.

#### IN PREPARATION

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1. **Bernstein, M.N.**, Ni, Z., Mohanty, C., Stewart, R., Newton, M., Kendzierski, C. SpatialCorr: Identifying gene sets with spatially varying correlation structure.

#### TALKS AND SEMINARS

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<b>Computation and Informatics in Biology and Medicine Seminar (UW-Madison)</b> <i>Unleashing the untapped potential of public genomics data</i>	March 23, 2021 Virtual
<b>Workshop on Computational Advances for Single-Cell Omics Data Analysis</b> <i>Cello: Comprehensive and hierarchical cell type classification of human cells with the Cell Ontology</i>	Dec. 12, 2020 Virtual
<b>International Conference on Intelligent Systems for Molecular Biology (ISMB)</b> <i>MetaSRA: Normalized sample-specific metadata for the Sequence Read Archive</i>	July 7, 2018 Chicago, IL
<b>Center for Predictive Computational Phenotyping Annual Retreat</b> <i>Cellular phenotyping with mass, heterogeneous transcriptomic data</i>	May 31, 2018 Madison, WI
<b>Computation and Informatics in Biology and Medicine Seminar (UW-Madison)</b> <i>Towards cell type prediction with public RNA-seq data</i>	Jan. 30, 2018 Madison, WI
<b>Center for Predictive Computational Phenotyping Annual Retreat</b> <i>MetaSRA: Normalized sample-specific metadata for the Sequence Read Archive</i>	June 1, 2017 Madison, WI

## POSTER PRESENTATIONS

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<b>Great Lakes Bioinformatics Conference</b>	Virtual, May 11-13, 2021
<b>Cold Spring Harbor Laboratory conference on Biological Data Science</b>	Virtual, Nov. 4-6, 2020
<b>International Conference on Intelligent Systems for Molecular Biology</b>	Virtual, July 13-16, 2020
<b>Great Lakes Bioinformatics Conference</b>	Madison, WI, May 19-22, 2019
<b>RNA-Seq Summit</b>	San Francisco, CA, Apr. 25-27, 2017
<b>National Library of Medicine Informatics Training Conference</b>	Columbus, OH, June 27-28 2016

## UNDERGRADUATE MENTORSHIP

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Aparna Maddala (Georgia Institute of Technology)	Summer 2019
<ul style="list-style-type: none"><li>• Integrated Biological Sciences Summer Research Program</li><li>• Project: <i>Hierarchical deconvolution of bulk RNA-seq data in the MetaSRA</i></li></ul>	
Brett VanTassel (Ramapo College of New Jersey)	Summer 2017
<ul style="list-style-type: none"><li>• Integrated Biological Sciences Summer Research Program</li><li>• Project: <i>Compression of RNA-seq alignments</i></li></ul>	
Kevin Liao (University of North Carolina at Chapel Hill)	Summer 2016
<ul style="list-style-type: none"><li>• Integrated Biological Sciences Summer Research Program</li><li>• Project: <i>Comparing similarity measures over RNA-seq derived gene expression profiles</i></li></ul>	

## TEACHING

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<b>Guest lecture, STAT 877 - Statistical Methods for Molecular Biology</b>	Sept. 22, 2020
<i>Visualizing high dimensional data with dimensionality reduction</i>	University of Wisconsin – Madison
<b>Guest lecture, STAT 877 - Statistical Methods for Molecular Biology</b>	Feb. 7, 2019
<i>Cellular phenotyping with public, heterogeneous RNA-seq data</i>	University of Wisconsin – Madison
<b>Primary lecturer, CS 302 - Introduction to Programming</b>	Aug. 2013 - May 2014
	University of Wisconsin – Madison
<ul style="list-style-type: none"><li>• Primary lecturer to approx. 30 out 700 students enrolled in CS 302</li><li>• Designed programming assignments for all approx. 700 students enrolled in CS 302</li></ul>	

## SERVICE

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<b>Journal Reviewer</b>	Ongoing
<ul style="list-style-type: none"><li>• Bioinformatics (1 review)</li><li>• BMC Bioinformatics (4 reviews)</li><li>• Breast Cancer Research and Treatment (1 review)</li><li>• Genes (1 review)</li><li>• Journal of Computational Biology (1 review)</li><li>• Nature Biotechnology (1 review)</li><li>• Nature Communications (2 reviews)</li><li>• Nucleic Acids Research (1 review)</li></ul>	
<b>Review Editor for <i>Frontiers in Genetics</i></b>	2021-Present
<b>Committee Member, Prospective Student Welcome Weekend</b>	Spring 2016
Department of Computer Sciences, University of Wisconsin – Madison	
<ul style="list-style-type: none"><li>• Organized the department's graduate student recruitment weekend</li><li>• Coordinated lodging, transportation, and social events</li></ul>	
<b>Committee Chair, Prospective Student Welcome Weekend</b>	Spring 2015
Department of Computer Sciences, University of Wisconsin – Madison	

- Led the organization of the department's graduate student recruitment weekend

**Club Leader, After-school Computer Programming Club**

Spring 2015

Stephen's Point Elementary School, Madison, WI

- Led an after-school computer programming club for 4th and 5th graders
- Taught the Scratch computer programming language

**Committee Member, Prospective Student Welcome Weekend**

Spring 2014

Department of Computer Sciences, University of Wisconsin – Madison

PROFESSIONAL ACTIVITIES

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**NCBI Single-cell in the Cloud Codeathon**

Jan. 15-17, 2020

Team Lead

New York, NY

- Led a team at a bioinformatics codeathon held at the New York Genome Center

**NCBI RNA-seq in the Cloud Codeathon**

Mar. 11-13, 2019

Team Lead

Chapel Hill, NC

- Led a team at a bioinformatics codeathon held at the University of North Carolina, Chapel Hill

PROFESSIONAL MEMBERSHIPS

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**International Society for Computational Biology**

**Tau Beta Pi**

**Upsilon Pi Epsilon**