

Brad Nelms, Ph.D.

Assistant Professor

Department of Plant Biology, University of Georgia

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EDUCATION

Harvard University

Nov. 2015

Ph.D. in Biophysics, Dissertation: *Understanding cell specialization through functional genomics*

Advisor: Wayne Lencer, M.D.

University of Wisconsin, Madison

June 2008

B.S. in Biochemistry, Chemistry, and Physics (triple major)

Graduation with Distinction, Comprehensive Honors in Biochemistry

FELLOWSHIPS

NSF Postdoctoral Research Fellowship in Biology, 3 years 2016 – 2019

NSF Graduate Research Fellowship, 3 years 2010 – 2013

Herchel Smith Graduate Fellowship, 2 years 2008 – 2010

*12 participating graduate programs at Harvard each nominated one candidate; 7 fellowships were awarded

RESEARCH EXPERIENCE

Postdoctoral Fellow, Stanford University

2016 – 2020

Department of Biology, Advisor: Virginia Walbot, Ph.D.

- Established single-cell RNA-sequencing methods in maize
- Identified multiple developmental intermediates during the first week of maize germinal cell differentiation, including a two-step transcriptome rearrangement in early meiotic prophase I
- Found that the transcriptional reorganization during meiosis did not require differentiation of the surrounding somatic cells or normal meiotic chromosome progression
- Devised analytical method ('pseudotime velocity') to quantify the rate of expression change over time from single cell data

This work resulted in 1 publication and two ongoing projects. Awarded 3-year postdoctoral fellowship from the National Science Foundation.

Graduate Student, Harvard University

2008 – 2015

Biophysics Program, Advisor: Wayne Lencer, M.D.

- Identified genes required for receptor-mediated transcytosis in an RNAi screen
- Developed bioinformatics method to infer which genes are expressed selectively in specific cell types, even when these cell types cannot be isolated experimentally
- Resolved relationship of a poorly characterized but abundant neural cell type, enteric glia, to other neural lineages through comparative transcriptomics

This work resulted in 3 publications (2 first author), 1 Bioconductor R package, and 1 ongoing project in the Lencer lab. Awarded pre-doctoral fellowship from the National Science Foundation and Herchel Smith Graduate Fellowship.

PUBLICATIONS

1. **Nelms, B.** and V. Walbot. Defining the developmental program leading to meiosis in maize. *Science*, 364:52-56 (2019).
2. **Nelms, B.**, N. Dalomba, and W. Lencer. A targeted RNAi screen identifies factors affecting diverse stages of receptor-mediated transcytosis. *Journal of Cell Biology*, 216:511-525 (2017).
*Selected for "Special collection of outstanding articles on lysosomes and endocytosis" by the Journal of Cell Biology editorial board
3. **Nelms, B.**, L. Waldron, L. Barrera, A. Weflen, J. Goettel, G. Guo, R. Montgomery, M. Neutra, D. Breault, S. Snapper, S. Orkin, M. Bulyk, C. Huttenhower, and W. Lencer. CellMapper: rapid and accurate inference of gene expression in difficult-to-isolate cell types. *Genome Biology*, 17:201 (2016).
4. Rao, M., **B. Nelms**, L. Dong, V. Salinas-Rios, M. Gershon, and G. Corfas. Enteric glia express Proteolipid Protein 1 and are a transcriptionally unique population of glia in the mammalian nervous system. *Glia*, 63:2040-2057 (2015).

HONORS

Best Poster Award, Gordon Research Conference on Meiosis	June 2018
Certificate of Distinction in Teaching, Harvard University	April 2010
Graduation with Distinction, UW-Madison	June 2008
Comprehensive Honors in Biochemistry, UW-Madison	June 2008
Departmental Honors in Biochemistry, UW-Madison	June 2008
Dean's List, UW-Madison (awarded all 8 semesters)	2004 – 2008
Wisconsin Scholars Scholarship	2004 – 2008
Kimberly-Clark Research Scholarship	2007 – 2008
Vector All-American Scholarship	2005

TEACHING AND MENTORING

Mentored Alan Tomusiak, including Senior Honors Thesis	2016 – 2019
Mentored Brendan Wu, Summer High School Internship	Summer 2018
Mentored Dan Holland, Summer Undergraduate Research	Summer 2017
Mentored Natasha Furtado-Dalomba, including Senior Honors Thesis	2013 – 2014
Mentored Arlo Lobascio, Summer Undergraduate Research	Summer 2011
Teaching Fellow for <i>Biochemistry of Membranes</i> , Harvard University	Fall 2009
*Awarded Certificate of Distinction in Teaching	
Tutor and Mentor, Hinton Scholars Program, Harvard Medical School	2009 – 2010
UW-Madison Peer Mentor Tutor Program	2006 – 2008
Biochemistry Peer Mentor Tutor (2007 – 2008)	
Physics Peer Mentor Tutor (2006 – 2007)	

SERVICE

Organized and developed *Science of Taste* demonstration for LGBTQ PRIDE event at the California Academy of Sciences June 2018

Member, Organizing Committee for Stanford / Carnegie Joint Plant Biology Retreat 2016 – 2017

Led small group to design T-shirt for Stanford / Carnegie Plant Biology Retreat 2017
*Design now used in other Carnegie Department of Plant Biology material

Volunteer, Boston Museum of Science 2008 – 2009

Reviewer for *Plant Cell*, *Frontiers in Plant Science*, *Plant Physiology*, *Theoretical and Applied Genetics*, and *The National Science Foundation*

PRESENTATIONS

Invited Talks

International Plant and Animal Genomes (PAG) Conference XXVIII (*Declined*)
San Diego, CA, January 2020

International Plant and Animal Genomes (PAG) Conference XXVII
San Diego, CA, January 2019

University of Oklahoma, Department of Microbiology & Immunology Seminar
Oklahoma City, September 2018

Institut National de la Recherche Agronomique, Meiotic Recombination and Synapsis Group
Versailles, France, March 2018

Selected Talks

Plant Genome Research Program, 21st Annual Awardee Meeting (*Lightning Talk*)
National Sciences Foundation Headquarters, Arlington, VA, September 2018

60th Annual Maize Genetics Conference
Saint Malo, France, March 2018

Other Talks / Poster Presentations

American Society of Plant Biology Annual Meeting, August 2019 (*Poster*)

National Plant Genome Initiative 5th Annual Postdoc Meeting, September 2018 (*Talk*)

Gordon Research Conference on Meiosis, June 2018 (*Poster*)

59th Annual Maize Genetics Conference, St. Louis, MO (*Poster*)

GI Enders Research Lecture, Boston Children's Hospital, April 2015 (*Talk*)

Harvard Biophysics Program Fall Retreat, September 2014 (*Poster*)

GI Enders Research Lecture, Boston Children's Hospital, January 2014 (*Talk*)

Harvard Biophysics Program Fall Retreat, October 2013 (*Talk*)

GI Enders Research Lecture, Boston Children's Hospital, May 2013 (*Talk*)

Harvard Biophysics Program Fall Retreat, September 2012 (*Poster*)

Herchel Smith U.S. Conference, Harvard University, June 2012 (*Poster*)

GI Enders Research Lecture, Boston Children's Hospital, December 2011 (*Talk*)

Harvard Biophysics Program Fall Retreat, September 2011 (*Poster*)

Harvard Biophysics Program Fall Retreat, September 2010 (*Poster*)

Biophysical Society Annual Meeting, Long Beach, CA, February 2008 (*Poster*)

PROFESSIONAL ASSOCIATIONS

American Biophysical Society
American Society of Cell Biology
American Society of Plant Biology
Out in STEM
Phi Beta Kappa