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## Nicolas J. Wheeler

### **Genetics & Genomics**

**Areas of Interest:** Neglected Tropical Diseases, Genomics, Vector-Borne Diseases, Teaching, Bioinformatics, Higher Education, Computational Biology, Parasitology

### Education

August 2013 - May 2017, Iowa State University, Ames, IA PhD in Genetics & Genomics

August 2009 - May 2013, William Jewell College, Liberty, MO BS in Oxbridge Honors Molecular Biology

## Research Experience

June 2017 - May 2019 | Research Associate

**Department of Pathobiological Sciences** 

University of Wisconsin-Madison

- Studied sensory, receptor, and secretory biology of filarial nematodes
- Advised by Mostafa Zamanian.

June 2017 - May 2019 | Post-Doctoral Fellow

**Department of Pathobiological Sciences** 

**University of Wisconsin-Madison** 

Merck KGaA Global Health Institute

- Developed techniques for transgenesis in the schistosome-vector Biomphalaria glabrata and its associated cell line, Bge.
- Sequenced the genome of the Bge cell line.
- Advised by Mostafa Zamanian and Tim Yoshino.

### August 2013 - May 2017 | Doctoral Research

Department of Biomedical Sciences, Iowa State University

- Genetics, bioinformatics, and evolutionary phylogenetics research focused on drug-target identification in parasitic flatworms
- Utilized free-living flatworms as models for parasites.
- Advised by Tim Day and Mostafa Zamanian.

### August 2009 - May 2013 | Undergraduate Research

Department of Biology, William Jewell College

- Bioinformatics and developmental biology research on free-living flatworms.
- Identified the Notch signaling pathway in *Schistosoma mansoni* and used RNAi to inhibit its functionality in *Schmidtea mediterranea*.
- Advised by Rose Reynolds

### August 2011 - May 2012 | Honors Research

Department of Microbiology and Immunology Indiana University School of Medicine, IUPUI

- Protozoan parasitology research. Studied the "acetyl-ome" of *Toxo-plasma gondii*.
- Advised by William Sullivan and Victoria Jeffers

May 2010 - July 2010 | Study Abroad Research

CPqRR/FIOCRUZ - CeBio, Belo Horizonte, Brazil

• Bioinformatics of Schistosoma mansoni.

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### **Publications**

Wheeler, N.J., Heimark, Z.W., Airs, P.M., Mann, A., Bartholomay, L.C., Zamanian, M. 2019. Genetic and functional diversification of chemosensory pathway receptors in filarial nematode parasites. bioRxiv. doi: https://doi.org/10.1101/683060.

International Helminth Genomes Consortium. 2018. Comparative genomics of the major parasitic worms. Nature Genetics. doi:10.1038/s41588-018-0262-1

Associated: Wheeler, N.J., Day, T.A., Zamanian, M. 2018. GPCR identification in parasitic worm genome assemblies. Nature Protocol Exchange. doi:10:1038/protex.2018.061

Wheeler, N.J., Dinguirard, N., Marquez, J., Gonzalez, A., Zamanian, M., Yoshino, T.P., Castillo, M.G. 2018. Sequence and structural variation in the genome of the *Biomphalaria glabrata* cell line. Parasites & Vectors. 11(1):496.

Hahnel, S., Wheeler, N.J., Lu, Z., Wangwiwatsin, A., McVeigh, P., Maule, A., Berriman, M., Day, T., Ribeiro, P., Grevelding, C.G. 2018. **Tissue-specific transcriptome analyses provide new insights into GPCR signaling in adult** *Schistosoma mansoni*. PLoS Pathogens. 14(1):e1006718.

Wheeler, N.J., Agbedanu, P.N., Kimber, M.J., Ribeiro, P., Day, T.A., Zamanian, M. 2015. Functional analysis of *Girardia tigrina* transcriptome seeds pipeline for anthelmintic target discovery. Parasites & Vectors. 8(1):34.

Zamanian, M., Agbedanu, P.N., **Wheeler, N.J.**, McVeigh, P., Kimber, M.J., Day, T.A. 2012. **Novel RNAi-mediated approach to G protein-coupled receptor deorphanization: proof of principle and characterization of a planarian 5-HT receptor.** PLoS One. 7(7):e40787.

### **Presentations**

### **Invited Presentations**

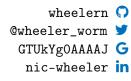
Wheeler, N.J., Airs, P.M., Zamanian, M. Mining the excretory-secretory system of filarial nematodes for new anthelmintic targets. Bridging the Divide: Parasitic Nematodes Workshop, GSA International *C. elegans* Conference, Los Angeles, CA, USA. 2019

Wheeler, N.J., Airs, P.M., Zamanian, M. Long-read RNA sequencing in neglected human parasites. Pacific Biosciences Certified Service Provider Launch, Madison, WI, USA. 2019

Wheeler, N.J., Zamanian, M. New insights into neglected diseases. University of Wisconsin-Whitewater Biology Forum, Whitewater, WI, USA. 2019

Wheeler, N.J., Dinguirard, N., Maier, T., Namigai, E.K.O., Tycko, J., Reinhard-Rupp, J., Yoshino, T.P., Zamanian, M. Progress toward transgenesis in *Biomphalaria glabrata* and implications for snail control. The Schistosomiasis Action Plan: next generation research on the road towards elimination., New Orleans, LA, USA. 2018

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#### **Oral Presentations**

Wheeler, N.J., Airs, P.M., Zamanian, M. Exploring new therapeutic targets for neglected parasites. Department of Pathobiological Sciences Research Seminar, Madison, WI. 2019

Wheeler, N.J., Dinguirard, N., Maier, T., Namigai, E.K.O., Tycko, J., Reinhard-Rupp, J., Yoshino, T.P., Zamanian, M. Toward transgenesis in *Biomphalaria glabrata*. 15th International Symposium on Schistosomiasis, Rio de Janeiro, Brazil. 2018

Wheeler, N.J., Yoshino, T.P., Zamanian, M. Adapting tools from freeliving nematodes to study chemosensory pathways in filarial nematode parasites. Chicago Area Worm Meeting, Chicago, IL. 2018

Wheeler, N.J., Zamanian, M. Computational and molecular pipelines to combat neglected parasites. Comparative Biomedical Sciences Recruitment Weekend, Madison, WI. 2018

Wheeler, N.J., Zamanian, M., Kimber, M.J., Day, T.A. Anthelmintic Targets in a Genomic World: a case study in GPCRs. Anthelmintics: Discovery to Resistance II, San Diego, CA. 2016.

Wheeler, N.J., Zamanian, M., Day, T.A. A *Girardia tigrina* transcriptome to aid in Neglected Tropical Disease research. 5th Annual Midwest Neglected Infectious Diseases Meeting, West Bend, IN. 2015

#### **Poster Presentations**

Wheeler, N.J., Heimark, Z.W., Airs, P.M., Mann, A., Bartholomay, L.C., Zamanian, M. Genetic and functional diversification of chemosensory pathway receptors in filarial nematode parasites. World Association for the Advancement of Veterinary Parasitology, Madison, WI. 2019

Wheeler, N.J., Heimark, Z.W., Airs, P.M., To, T.H., Chen, E.N., Bartholomay, L.C., Zamanian, M. Conserved and divergent aspects of chemosensory signaling in filarial parasitic nematodes. Molecular Helminthology, San Antonio, TX. 2019

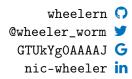
Wheeler, N.J., Golfinos, A., Gilsdorf, C., Meikle, T., Zamanian, M. Tissue-specific heterologous expression of *Brugia malayi* GPCRs in *Caenorhabditis elegans*. Molecular Helminthology, San Antonio, TX. 2019

Wheeler, N.J., Dinguirard, N., Maier, T., Namigai, E.K.O., Tycko, J., Reinhard-Rupp, J., Yoshino, T.P., Zamanian, M. Toward transgenesis in *Biomphalaria glabrata*. 15th International Symposium on Schistosomiasis, Rio de Janeiro, Brazil. 2018

Wheeler, N.J., Meikle, T., Fraser, L., Srinivasan, D., To, T., Airs, P., Kimber, M.J., Bartholomay, L., Zamanian, M. Exploring sensory pathways and behaviors in filarial nematode parasites. *C. elegans* Neuronal Development, Synaptic Function & Behavior Topic Meeting, Madison, WI. 2018

Wheeler, N.J., Zamanian, M., Kimber, M.J.K, Day, T.A. The cysloop superfamily of platyhelminths and nematodes. Molecular Helminthology, Cape Cod, MA. 2017

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## **Teaching Experience**

# Spring 2019 | PATHBIO 514 - Veterinary Parasitology, University of Wisconsin-Madison

- Gave four, 50 minutes lectures, a review session, and two 3 hour lab sessions on trematodes and cestodes of veterinary and zoonotic importance.
- Evaluated 4.4/5 by 119 students in "overall evaluation of Dr. Wheeler's teaching ability."

# Spring 2017 | V PTH 353 - Introduction to Parasitology, Iowa State University

- Responsible for one week of an undergraduate parasitology course.
- Wrote 8 exam questions for my section.

# Spring 2017 | BMS 329 - Anatomy and Physiology of Domestic Animals, Iowa State University

- Responsible for one week of an undergraduate course.
- Gave three, 50 minute lectures.
- Wrote 14 exam questions for my section.
- Provided 3 quiz questions via Blackboard in between each lecture.
- Utilized TopHat for in class participation and assessment.

# August 2016 - May 2017 | Preparing Future Faculty, Iowa State University

 An enriching program that seeks to best prepare graduate students for a career in academia by offering teaching, mentoring, and learning opportunities.

### March 2016 | HHMI Learning Facilitator, Iowa State University

- Mentored and lead two groups of undergraduates in BIO313L, a lab section that studied synthetic biology in yeast.
- Received HHMI certificate of completion.

## **Undergraduate Mentoring**

### Tran To | Undergraduate Researcher | 2017 - Present

- Current trainee in the UWM Pharmacology Toxicology program
- Appeared in one Zamanian Lab poster in 2019, and presented her own poster at the UWM Undergraduate Research Symposium and Pharm-Tox Research Symposium

### Eric Chen | Undergraduate Researcher | 2017 - 2019

- Current NIH Postbac IRTA award winner and trainee
- Appeared in one Zamanian Lab poster in 2019, and presented his own poster at the UWM Undergraduate Research Symposium

### Alexis Mann | Honorary Research Fellow | 2017

- Current PhD student at Johns Hopkins University
- Appeared in one Zamanian Lab pre-print in 2019

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## **Grants & Proposals**

2017 - 2019 | Merck KGaA Global Health Institute (MGHI). Primary Author and Investigator.

Driving Schistosome-Resistance in Biomphalaria.

Funded: 1 year and extended 1 year - \$75,000/year.

2015 - 2017 | Iowa State University College of Veterinary Medicine Seed Grant. Primary Author and Co-Investigator.

An Optimized CRISPR/Cas9 Protocol for Genome Editing in *Schistosoma mansoni*. Funded: 1 year and extended 1 year - \$20,000/year.

### **Service**

#### **Peer Review**

See my Publons profile for a validated list of my contributions to peer review

#### Reviewer for:

- BMC Genomics
- PLOS Neglected Tropical Diseases
- Molecular and Biochemical Parasitology
- International Journal for Parasitology
- International Journal for Parasitology: Drugs and Drug Resistance

### 2013 - 2017 | Coordinator for the Rosebud Exchange Program

I provided leadership and management for the Rosebud Exchange Program at Cornerstone Church of Ames, IA. This program invites schoolaged Native Americans from the Rosebud Indian Reservation in South Dakota to live with families in Story County, Iowa, and attend school. We seek to provide a better education to some of the most underserved and underrepresented communities in our country.

### 2016 - 2017 | Meeker Elementary Mentor

Once a week, I went to Meeker Elementary School in Ames, IA, to eat lunch and spend recess with an at-risk student in the 4th grade. I helped teach him proper public behavior, how to make and keep friends, and how to interact with other adults and children.

## **Honors & Awards**

- February 2016 | Anthelmintics Symposium Travel Grant
- February 2016 | ISU GPSS Professional Advancement Grant
- February 2016 | Interdepartmental Genetics and Genomics Travel Award
- 2015 2016 | Brown Research Fellowship, Iowa State University \$10,000
- 2013 2017 | Graduate College Fellowship, Iowa State University \$14,400/year
- 2013 2017 | Biotechnology Fellowship, Iowa State University \$4320/year
- 2009 2013 | Jewell Scholarship, William Jewell College Full Tuition, estimated ~\$30,000/year

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## **Formalized Training**

- Summer 2018 | FR3 Minicourse | University of Wisconsin-Oshkosh Dr. Shelly Michalski and Steve Schaar
- Summer 2018 | Research Mentor Training | WISCIENCE Dr. Anne Lynn Gillian-Daniel and Dr. Michelle Keller-Pearson
- 2016 2017 | Preparing Future Faculty | Iowa State University Dr. Holly Bender and Karen Bovenmyer