

# Brittany Faye Peterson

## Contact Information

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**Position:** PERT Postdoctoral Fellow

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## Education

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Purdue University West Lafayette, IN

Ph.D., Entomology & Molecular Evolutionary Genetics Spring 2016

Advisor: Michael E. Scharf (mscharf@purdue.edu)

Dissertation: Investigating physiological collaborations between a lower termite and its symbionts

Western Illinois University Macomb, IL

M.S., Biology Spring 2011

Advisor: Sue M. Hum-Musser (sm-hum-musser@wiu.edu)

Thesis: The role of whitefly bacterial endosymbiont GroEL proteins in the transmissibility of *Squash Leaf Curl Virus*

Western Illinois University Macomb, IL

B.S., Microbiology, *magna cum laude*, University Honors Fall 2008

Advisor: Timothy W. Spier (tspier@murraystate.edu)

Thesis: The effect of water quality on the alarm pheromone response in fathead minnows, *Pimephales promelas*

## Research Experience

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Postdoctoral Research April 2016-Present

Supervisor: Dr. S. Patricia Stock

Description: Physiological interactions governing entomopathogenic nematode-bacterial symbioses

Japanese Beetle & Soil Microbe Collaboration March 2014-Present

Collaborators: Drs. Michael E. Scharf, Doug Richmond, & Garrett Price (MS student) at Purdue University

Description: Characterization of microbial communities associated with Japanese beetles and their environment

Ph.D. Dissertation Research May 2012-April 2016

Supervisor: Dr. Michael E. Scharf

Description: Termite host-symbiont associations and physiological collaborations

i5k Genome Curation Collaboration March 2014-May 2015  
Collaborators: Members of the Multi-Institution, Bed Bug Genome Consortium  
Description: Participated in the annotation and curation of antioxidant genes from the bed bug, *Cimex lectularius*

Ph.D. Rotation Research August 2011-April 2012  
Supervisors: Drs. Catherine Hill (Aug-Oct), Jeffery Stuart (Oct-Dec), Clifford Weil (Jan-Mar), Michael E. Scharf (Mar-Apr)  
Description: Four 8-week rotations in various laboratories across Purdue Agriculture

Master's Thesis Research August 2009-May 2011  
Supervisor: Dr. Sue M. Hum-Musser  
Description: Whitefly-symbiont-virus interactions and impact on plant virus vectoring

Summer Research Internship May 2010-August 2010  
Supervisors: Drs. Sue M. Hum-Musser & Richard O. Musser  
Description: Herbivore-plant interactions, field and lab technician

Undergraduate Thesis Research January 2008-December 2008  
Supervisor: Dr. Timothy W. Spier  
Description: Impacts of water quality on fish alarm pheromone responses

## **Teaching Training & Experience**

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### *Training*

Graduate Teaching Certificate August 2014-April 2016  
Description: A program operated through the Center for Instructional Excellence at Purdue University to document teaching activities of a graduate student. This certificate requires: teaching orientation; 9 hours of teaching development workshops; microteaching lecture with consultative feedback; 2 semesters of classroom teaching; classroom observations; and self, student, and colleague evaluations.

### *Experience*

Insect Ecology Guest Lecturer April 2016  
Lecture Title: Insect-Microbe Interactions: A Spectrum of Symbioses

Advanced Insect Taxonomy Co-Instructor March 2015-December 2015  
Supervisor: Dr. Jennifer Zaspel  
Description: Integrated molecular techniques into existing curriculum, developed learning objectives, constructed course budget, delivered select lectures, taught all molecular biology labs, assisted with other lab activities, managed electronic resources/gradebook, held review sessions and office hours, and accompanied class on multiple, overnight field collection trips.

Insect Care & Use Course Development & Instructor May 2014-March 2015  
Supervisor: Dr. Jonathon Neal  
Description: Development of introductory non-majors entomology course in the IMPACT style of student engagement including: syllabus construction, lesson planning, rearing

of insects and non-insect arthropods, assessment preparation, and assembly of course web-resources.

Microbiology Lab Preparation Supervisor January 2011-May 2011

Supervisor: Hillary Parks

Description: Lead weekly meeting for teaching assistants, organized lab introduction material, managed lab supplies, prepared media, instruments, specimen, and materials for 8 laboratory sections.

Cell & Molecular Biology Teaching Assistant January 2011-May 2011

Supervisor: Dr. Sue M. Hum-Musser

Description: Instructed labs, graded, wrote, and administered lab quizzes, assisted with lecture classes.

Microbiology Teaching Assistant August 2009-May 2011

Supervisors: Ashley Morhardt (2009-2010), Hillary Parks (2010-11)

Description: Instruction of labs, graded, wrote, and administered lab quizzes, tutor students in the biology resource center, assisted in lecture classes including exam proctoring, and attendance management.

## Publications

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### Peer-Reviewed

**Peterson, BF**, and Scharf, ME. 2016. Lower Termite Associations with Microbes: Synergy, Protection, and Interplay. *Frontiers in Microbiology*. 7:422.

Benoit, JB, Adelman, ZN ... **Peterson, BF** (34/81)... Schal, C, and Richards, S. 2016. Unique features of a global human ectoparasite identified through sequencing of the bed bug genome. *Nature Communications* 7:10165.

**Peterson, BF**, Stewart, HL, and Scharf, ME. 2015. Quantifying symbiotic contributions to lower termite digestion using antimicrobial compounds. *Insect Biochemistry and Molecular Biology* 59: 80-88.

Sen, R, Raychoudhury, R, Cai, Y, Sun, Y, Ulrike-Lietze, V, **Peterson, BF**, Scharf, ME, and Boucias, DG. 2015. Molecular signatures of nicotinoid-pathogen synergy in the termite gut. *PLOS ONE* 10: e0123391.

Zhao, C, Escalante, LN ... **Peterson, BF** (46/69) ... Stuart, JJ, and Richards, S, 2015. A massive expansion of effector genes underlies gall-formation in the wheat pest *Mayetiola destructor*. *Current Biology* 25: 1-8.

### Direct-Submission

**Peterson, BF**, 2014. A student's perspective on graduate training, *In Proceedings, 14th National Conference on Urban Entomology, 18-21 May 2014, San Antonio, TX.* [Available here](#)

### In-Preparation

**Peterson, BF**, and Scharf, ME. Novel metatranscriptome analysis reveals bacterial symbiont contributions to pathogen defense in a lower termite. *In prep.*

## Presentations

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### Invited Talks

2016

*It Takes a Village: Insights into how termites and symbionts collaborate physiologically* (International Graduated Student Showcase; 2016 XXV International Congress on Entomology Orlando, FL)

2014

*Unraveling tri-partite symbiosis in the termite gut with the goal of improved biomass-to-biofuel processing* (Member Symposium: Horizons in the Field of Symbiosis; Entomological Society of America 62<sup>nd</sup> Annual Meeting, Portland, OR)

*A student's perspective on graduate training.* (Member Symposium: Significance of Science and Entomology Literacy in Graduate Student Training; National Conference on Urban Entomology 2014 Meeting, San Antonio, TX)

*Understanding the Holobiont: Importance of symbiotic bacteria in termite digestion* (PULSe Seminar Series; Purdue University, West Lafayette, IN)

### Submitted Talks

2015

*Pathogen-specific immune responses from symbionts in a subterranean termite, *Reticulitermes flavipes* (Kollar)* (Student 10-Minute Paper Competition; Entomological Society of America 63<sup>rd</sup> Annual Meeting, Minneapolis, MN)

*Pathogen-specific immune responses from symbionts in a subterranean termite, *Reticulitermes flavipes* (Kollar)* (Ph.D. Student Presentation Competition; 2015 Ohio Valley Entomological Association Meeting, University of Kentucky, Lexington, KY)

*Understanding bacterial contributions to termite nutritional immunity using the *Reticulitermes flavipes* holobiont as a model* (PULSe 5-Minute Thesis Competition; Purdue University, West Lafayette, IN)

2014

*Investigating symbiont-mediated protection in termites* (Student 10-Minute Paper Competition; Entomological Society of America 62<sup>nd</sup> Annual Meeting, Portland, OR)

*Investigating symbiont-mediated protection in termites* (Ph.D. Student Presentation Competition; 2014 Ohio Valley Entomological Association Meeting, The Ohio State University, Columbus, OH)

*Bacteria are important for termite wood digestion* (3-Minute Thesis Competition Finals; West Lafayette, IN)

2013

*The importance of symbiotic, prokaryotic groups in termite digestion of lignocellulose* (Student 10-Minute Paper Competition; Entomological Society of America 61<sup>st</sup> Annual Meeting, Austin, TX)

*How important are bacteria for termite nutrition?* (3-Minute Thesis Competition; Purdue University, West Lafayette, IN)

2012

*A Tripartite Termite-Protozoa-Bacteria Symbiosis: Impact of different endosymbiotic groups on Reticulitermes flavipes lignocellulose digestion* (Student 10-Minute Paper Competition; Entomological Society of America 60<sup>th</sup> Annual Meeting, Knoxville, TN)

2011

*Specificity and binding of whitefly bacterial endosymbiont GroEL proteins to Squash Leaf Curl Virus coat protein affects SLCV transmission to host plants by their whitefly vector Bemisia tabaci* (Biology Graduate Research Symposium; Western Illinois University, Macomb, IL)

2010

*The role of whitefly bacterial endosymbiont GroEL proteins in the transmissibility of Squash Leaf Curl Virus* (Student 10-Minute Paper Competition; Entomological Society of America 58<sup>th</sup> Annual Meeting, San Diego, CA)

Selected Posters

2016

*A metatranscriptomic approach aimed at understanding bacterial roles in the termite holobiont* (80<sup>th</sup> Annual Purdue Pest Management Conference, West Lafayette, IN)

2015

*A metatranscriptomic approach aimed at understanding bacterial roles in the termite holobiont* (Physiology, Biochemistry, & Toxicology Poster Session; Entomological Society of America 63<sup>rd</sup> Annual Meeting, Minneapolis, MN)

*Termite Friends & Foes: Understanding how symbiotic microbes contribute to pathogen defense in a subterranean termite* (130<sup>th</sup> Annual Meeting of the Indiana Academy of Sciences, Indianapolis, IN)

2014

*The importance of symbiotic, prokaryotic groups in termite digestion of lignocellulose* (#Science: Effective Interdisciplinary Communication, Purdue University, West Lafayette, IN.)

*The importance of symbiotic, prokaryotic groups in termite digestion of lignocellulose* (16<sup>th</sup> Annual Fall Symposium: The Macro-Influence of Microorganisms, Donald Danforth Plant Science Center, St. Louis, MO)

*Termite Lignocellulose Digestion: A product of tripartite symbiosis* (2014 Office of Interdisciplinary Graduate Programs Spring Reception, Purdue University, West Lafayette, IN)

2013

*Understanding the importance of the microbiome in the nutritional immunology of a pest termite* (2013 Office of Interdisciplinary Graduate Studies Spring Reception, Purdue University, West Lafayette, IN)

2012

*Investigating the importance of heat-shock proteins in Reticulitermes flavipes immunity* (2012 PULSe Retreat, Purdue University, West Lafayette, IN)

*Genetic mapping of carbon partitioning genes in maize* (PULSe First Year Student Poster Competition, Purdue University, West Lafayette, IN)

## **Grants & Fellowships**

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Postdoctoral Excellence in Research & Teaching (PERT) Fellowship Center for Insect Science at University of Arizona   Tucson, AZ	April 2016
Monsanto Student Travel Award- \$1,250 63 <sup>rd</sup> Annual Entomological Society of America Meeting   Minneapolis, MN.	November 2015
Purdue Graduate Student Government Professional Grant- \$1,281 Purdue University   West Lafayette, IN.	May 2015
Monsanto Research Grant- \$7,320 62 <sup>nd</sup> Annual Entomological Society of America Meeting   Portland, OR.	November 2014
PULSe Travel Grant- \$300 Purdue University Life Science Interdisciplinary Program   West Lafayette, IN.	November 2014
Indiana Academy of Science Senior Research Grant- \$2,955 Indiana Academy of Sciences   Indianapolis, IN.	May 2014
Purdue Graduate Student Government Travel Grant- \$1,000 Purdue University   West Lafayette, IN.	April 2014
Graduate Women in Science Travel Grant- \$500 Purdue University Science Diversity Office   West Lafayette, IN.	April 2014
Lillian and Alex Feir Graduate Student Travel Grant- \$450 61 <sup>st</sup> Annual Entomological Society of America Meeting   Austin, TX.	November 2013
Purdue Graduate Student Government Travel Grant- \$1,000 Purdue University   West Lafayette, IN.	April 2013
PULSe Travel Grant- \$200 Purdue University Life Science Interdisciplinary Program   West Lafayette, IN.	November 2012
College of Arts & Sciences Undergraduate Research Grant- \$250 Western Illinois University   Macomb, IL.	March 2008
Illinois Centennial Honors College Undergraduate Research Grant- \$500 Western Illinois University   Macomb, IL.	March 2008

## **Honors & Awards**

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2016 Outstanding Graduate Teaching Assistant in the College of Agriculture Purdue University College of Agriculture   West Lafayette, IN.	April 2016
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2016 Graduate School Excellence in Teaching Award- <i>nominated</i> Purdue University Graduate School   West Lafayette, IN.	April 2016
2 <sup>nd</sup> Place Ph.D. Student Talk 2015 Ohio Valley Entomological Association Meeting   Lexington, KY.	October 2015
PULSe Featured Student Profile Purdue Office of Interdisciplinary Graduate Programs   West Lafayette, IN.	October 2015
William L. Brehm Memorial Scholarship Purdue University Department of Entomology   West Lafayette, IN.	August 2015
Teaching Academy Graduate Teaching Award Purdue University Teaching Academy   West Lafayette, IN.	April 2015
1 <sup>st</sup> Place PULSe 5-Minute Thesis Competition Award Purdue University Life Science Interdisciplinary Program   West Lafayette, IN.	January 2015
Pest Control Magazine Scholarship Purdue University Department of Entomology   West Lafayette, IN.	January 2015
Graduate Ag Research Spotlight ( <a href="#">Link</a> ) Purdue College of Agriculture   West Lafayette, IN.	December 2014
3 <sup>rd</sup> Place Ph.D. Student Talk 2014 Ohio Valley Entomological Association Meeting   Columbus, OH.	October 2014
1 <sup>st</sup> Place Poster Award #Science: Effective Interdisciplinary Communication   West Lafayette, IN.	September 2014
Best Poster Award 16 <sup>th</sup> Annual Donald Danforth Plant Science Center Fall Symposium   St. Louis, MO.	September 2014
Purdue Entomology Graduate Organization Student Spotlight ( <a href="#">Link</a> ) Purdue University Department of Entomology   West Lafayette, IN.	August 2014
Graduate Fellowship Incentive Award 16 <sup>th</sup> Annual Donald Danforth Plant Science Center Fall Symposium   St. Louis, MO.	January 2014
Oser Family Scholarship Purdue University Department of Entomology   West Lafayette, IN.	August 2013
Newly Placed Student Featured Profile ( <a href="#">Link</a> ) Purdue University Life Science Interdisciplinary Program   West Lafayette, IN.	October 2012
1 <sup>st</sup> Place Platform Presentation Biology Graduate Research Symposium   Macomb, IL.	March 2011
President's Prize for Student Oral Presentation 58 <sup>st</sup> Annual Entomological Society of America Meeting   San Diego, CA.	December 2010

## **Leadership Experience**

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Founding Member & PR/Social Media Chair Purdue Grad Women in Agriculture   West Lafayette, IN.	June 2015 – April 2016
Graduate Student Forum Chair Entomology Graduate Organization   West Lafayette, IN.	March 2014-April 2016
Graduate Women in Science Program Leadership Team Member Purdue University Science Diversity Office   West Lafayette, IN.	March 2013 - May 2015
President PULSe Graduate Student Organization   West Lafayette, IN.	May 2013 - April 2014
Journal Club Chair Entomology Graduate Organization   West Lafayette, IN.	January - December 2013
Activity Coordinator PULSe Graduate Student Organization   West Lafayette, IN.	May 2012 - April 2013

## **Mentoring**

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Undergraduate Mentoring Hannah L. Stewart (B.S., Microbiology 2016) Huizhe "Roy" Zhou (B.S., Entomology 2013)	March 2013-May 2016 March 2012-May 2013
PULSe Peer Mentoring Fabiola Muro Villanueva (PULSe 2013 Cohort) Ariangela Kozik (PULSe 2013 Cohort) Elizabeth Eckhardt (PULSe 2013 Cohort) Shuomeng Guang (PULSe 2013 Cohort) Shaminie Athinarayanan (PULSe 2012 Cohort) Ruth Arieti (PULSe 2012 Cohort)	July 2013-April 2016 July 2013-April 2016 July 2013-April 2016 July 2013-January 2014 July 2012-April 2016 July 2012-April 2016

## **Campus Involvement & Community Outreach**

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Curriculum & Student Relations Committee Grad Student Rep Purdue University College of Agriculture   West Lafayette, IN.	August 2015-April 2016
Faculty Search Committee (Insect Physiologist: Insect-Microbe Assoc.) Purdue University Department of Entomology   West Lafayette, IN.	August 2015-March 2016
Awards Committee Ph.D. Student Representative Purdue University Department of Entomology   West Lafayette, IN.	April 2015-February 2016
Spring Reception Poster Judge Purdue University Life Science Interdisciplinary Program   West Lafayette, IN.	April 2015
PULSe Science Booth Volunteer Purdue University Spring Fest   West Lafayette, IN.	April 2012, 2013, & 2014
Science in Schools Volunteer	September 2011-April 2014



Burnett Creek Elementary School | West Lafayette, IN.

Junior & Senior High School Microbe Mission Judge  
Illinois Science Olympiad | Macomb, IL.

April 2011

## **Workshops & Additional Training**

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Sequence Analysis Training Workshop- Purdue University November 2015  
Instructors: Karthik Padmanabahn and Xiangying Sun, Ph.D. Candidates in Computational Interdisciplinary Graduate Program

Community Cluster Computing- Purdue University October 2015  
Instructors: Steve Kelly, Scott Hicks, Stephen Harrell, Dr. Gladys Andino, Dr. Bayu Zhang, & Dr. Xiao Zhu

Unix 101- Purdue University September 2015  
Instructors: Steve Kelley, Stephen Harrell, Dr. Gladys Andino, & Dr. Lev Gorenstein

Insect Pathology Short Course- Cornell University June 2015  
Instructors: Drs. Louela Castrillo, Ann Hajek, Richard Humber, Leellen Solter, & David Shapiro-Ilan

## **Professional Society Membership**

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Association for Women in Science August 2014-Present  
Entomological Society of America June 2010-Present  
AAAS/Science Program of Excellence in Science July 2015-Present  
Ohio Valley Entomological Association October 2014-October 2016  
Indiana Academy of Sciences February 2014-February 2016  
National Conference on Urban Entomology February 2014-December 2015