

# JOSHUA D. GIBSON

## CURRICULUM VITAE

### Personal Information

---

Position: Assistant Professor  
Address: Georgia Southern University | Dept. of Biology | P.O. Box 8042-1 | Statesboro, GA 30460  
Telephone: (484) 363-1652  
Email: [jgibson@georgiasouthern.edu](mailto:jgibson@georgiasouthern.edu), [jdgibson@asu.edu](mailto:jdgibson@asu.edu) (secondary)

### Education

---

**Arizona State University** **Tempe, AZ**  
Ph.D., Biology Spring 2013  
Advisor: Jürgen Gadau  
Dissertation: The genetics of speciation in the parasitoid wasp, *Nasonia*.

**Arizona State University** **Tempe, AZ**  
M.S., Biology (advanced to Candidacy) Summer 2011  
Advisor: Jürgen Gadau

**Loyola College in Maryland (now Loyola University)** **Baltimore, MD**  
B.S., Biology, cum laude Spring 2004  
Advisor: David B. Rivers  
Research project: Characterization of autoimmunity to venom in Tarantulas (*Grammostola rosea*).

### Honors and Awards

---

**Purdue Postdoc Travel Grant \$750** **Summer 2016**  
Purdue University | West Lafayette, IN

**Indiana Academy of Sciences Senior Research Grant \$2,934** **Spring 2014**  
Indiana Academy of Sciences | Indianapolis, IN

**School of Life Sciences Completion Research Assistantship \$10,484** **Spring 2013**  
Arizona State University | Tempe, AZ

**Achievement Rewards for College Scientists Award \$7,000** **2012-2013**  
ARCS Foundation | Phoenix, AZ

**Graduate Research Support Grant \$2,000** **Fall 2011**  
Arizona State University | Tempe, AZ

**Teaching Associate of the Year, Honorable Mention** **2010-2011**  
Arizona State University | Tempe, AZ

**School of Life Sciences Conference travel awards \$1,850** **2008-2012**  
Arizona State University | Tempe, AZ

**Tri-Beta Biological Honors Society** **2002-2004**  
Loyola College in Maryland (now Loyola University) | Baltimore, MD

**Dean's List** **2000-2004**  
Loyola College in Maryland (now Loyola University) | Baltimore, MD

## Peer-reviewed publications

---

- [15] **Gibson JD**, Hunt GJ (2016) The complete mitochondrial genome of the invasive Africanized Honey Bee, *Apis mellifera scutellata* (Insecta: Hymenoptera: Apidae). **Mitochondrial DNA**, Apr; (DOI:10.3109/19401736.2014.905858)
- [14] **Gibson JD**, Arechavaleta-Velasco ME, Tsuruda JM, Hunt GJ (2015) Biased allele expression and aggression in hybrid honeybees may be influenced by inappropriate nuclear-cytoplasmic signaling. **Frontiers in Genetics**, Dec; 6. (DOI: 10.3389/fgene.2015.00343)
- [13] Kocher SD\*, Tsuruda JM\*, **Gibson JD\***, Emore CM, Arechavaleta-Velasco ME, Queller DC, Strassmann JE, Grozinger CM, Gribskov MR, San Miguel P, Westerman R, Hunt GJ (2015) A Search for Parent-of-Origin Effects on Honey Bee Gene Expression. **G3: Genes | Genomes | Genetics**, June; g3. 115.017814 (DOI: 10.1534/g3.115.017814)  
\*equal contribution
- [12] **Gibson JD\***, Niehuis O\*, Peirson B, Cash EI, Gadau J (2013) Genetic and developmental basis of F2 hybrid breakdown in *Nasonia* parasitoid wasps. **Evolution**, July; 67:2124-2132 (DOI: 10.1111/evo.12080)  
\*equal contribution
- [11] Niehuis O\*, Buellesbach J\*, **Gibson JD\***, Pothmann D, Hanner C, Mutti NS, Judson AK, Gadau J, Ruther J\*, Schmitt T. (2013) Behavioural and genetic analyses on *Nasonia* shed light on the evolution of sex pheromones. **Nature**, Feb; 494: 345-348 (DOI:10.1038/nature11838)  
\*equal contribution; #responsible for molecular procedures.
- [10] Smith CR, Smith CD, Robertson HM...**Gibson JD** (18/45)...Gadau J. (2011) A draft genome of the red harvester ant, *Pogonomyrmex barbatus*: a model for reproductive division of labor and social complexity. **Proceedings of the National Academy of Sciences (USA)**, Apr; 108:5667-5672 (DOI:10.1073/pnas.1007901108)
- [9] Smith CD, Abouheif E, Benton R...**Gibson JD** (12/50)...Tsutsui ND. (2011) The draft genome of the globally widespread and invasive Argentine ant (*Linepithema humile*). **Proceedings of the National Academy of Sciences (USA)**, Apr; 108:5673-5678 (DOI:10.1073/pnas.1008617108)
- [8] Suen G, Teiling C, Li L...**Gibson JD** (15/49)...Currie CR. (2011) The genome sequence of the leaf-cutter ant *Atta cephalotes* reveals insights into its obligate symbiotic lifestyle. **PLoS Genetics** 7(2): e1002007. (DOI:10.1371/journal.pgen.1002007)
- [7] **Gibson JD\***, Niehuis O\*, Verrelli BC, Gadau J. (2010) Contrasting patterns of selective constraints in nuclear encoded genes of the oxidative phosphorylation pathway in holometabolous insects and their possible role in hybrid breakdown in *Nasonia*. **Heredity**, Mar; 104:310-317 (DOI:10.1038/hdy.2009.172)  
\*equal contribution
- [6] Beukeboom, LW, Niehuis O, Pannebakker BA, Koevoets T, **Gibson JD**, Shuker DM, van de Zande L, Gadau J. (2010) A comparison of recombination frequencies in intraspecific versus interspecific mapping populations of *Nasonia*. **Heredity**, Mar; 104:302-309 (DOI:10.1038/hdy.2009.185)

- [5] Kim J, Cunningham R, James B, Wyder S, **Gibson JD**, Niehuis O, Zdobnov EM, Robertson HM, Robinson GE, Werren JH, Sinha S. (2010) Functional Characterization of Transcription Factor Motifs Using Cross-species Comparison across Large Evolutionary Distances. **PLoS Computational Biology**, Jan; 6(1):e1000652 (DOI:10.1371/journal.pcbi.1000652)
- [4] Niehuis O, **Gibson JD**, Rosenberg MS, Pannebakker BA, Koevoets T, Judson AK, Desjardins CA, Kennedy K, Duggan D, Beukeboom LW, van de Zande L, Shuker DM, Werren JH, Gadau J. (2010) Recombination and Its Impact on the Genome of the Haplodiploid Parasitoid Wasp *Nasonia*. **PLoS ONE**, Jan; 5:e8597 (DOI: 10.1371/journal.pone.0008597)
- [3] Werren JH, Richards S, Desjardins CA...**Gibson JD**# (57/157)...Gibbs RA. (2010) Functional and Evolutionary Insights from the Genomes of Three Parasitoid *Nasonia* Species. **Science**, Jan 15; 327:343-348 (DOI: 10.1126/science.1178028)  
#design and analysis of SNP genotyping microarray, gene annotation
- [2] Loomes KM, Stevens SA, O'Brien ML, Gonzalez DM, Ryan MJ, Segalov M, Dormans NJ, Mimoto MS, **Gibson JD**, Sewell W, Schaffer AA, Nah HD, Rappaport EF, Pratt SC, Dunwoodie SL, Kusumi K. (2007) Dll3 and Notch1 genetic interactions model axial segmental and craniofacial malformations of human birth defects. **Developmental Dynamics**, Oct; 236:2943-2951 (DOI: 10.1002/dvdy.21296)
- [1] William DA, Saitta B, **Gibson JD**, Traas J, Markov V, Gonzalez DM, Sewell W, Anderson DM, Pratt SC, Rappaport E, Kusumi K. (2007) Identification of oscillatory genes in somitogenesis from functional genomic analysis of a human mesenchymal stem cell model. **Developmental Biology**, May 1; 305:172-186 (DOI: 10.1016/j.ydbio.2007.02.007)

## Presentations

---

### Invited Talks

- 2015** *Aggression and metabolism in hybrid honey bees is linked to allele specific expression.* Society of America 63<sup>rd</sup> Annual Meeting, Minneapolis, MN. 15-18 Nov.  
**Selected as one of 20 premier presentations.**
- *Incompatible genic interactions in hybrids: Evidence from jewel wasps and honey bees.* Earlham College Biology seminar, Richmond, IN. 1 Oct.
  - *Incompatible Genic Interactions In Hybrids: Evidence From Jewel Wasps And Honey Bees.* Purdue University Entomology Departmental Seminar, West Lafayette, IN. 5 Mar.
  - *Allele specific expression and nuclear-mitochondrial interactions in hybrid honey bees.* Social Insect Research Group Seminar, Arizona State University, Tempe, AZ. 26 Jan.
- 2014** *Nuclear-mitochondrial interactions and gene expression in honeybee hybrids: links between aggression and metabolism.* Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias, Ajuchitlan, Mexico. 1 Dec.

### Submitted and Departmental Presentations (T=talk, P=poster)

---

- 2017** *Aggression and Metabolism in Hybrid Honey Bees.* University of California, Berkeley Essig Museum Seminar, Berkeley, CA. 3 Mar. **T**
- 2016** *Aggression and Allele Specific Expression in Hybrid Honey Bees.* XXV International Congress of Entomology, Orlando, FL. 25-30 Sept. **T**

- *The Epigenetic Basis of Aggression in Hybrid Honey Bees*. International Union for the Study of Social Insects North American Section meeting, Orlando, FL. 24 Sept. **P**.
- 2015** *Aggression, metabolism and allele specific expression in hybrid honey bees*. Biology and Genomics of Social Insects Meeting, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY. 2-5 May. **T**
- *Nuclear-mitochondrial interactions and gene expression in honeybee hybrids: links between aggression and metabolism*. American Bee Research Conference, Tucson, AZ. 22-23 Jan. **T**
- 2014** *Nuclear-mitochondrial interactions and gene expression in hybrid Honey Bees (*Apis mellifera*)*. Entomological Society of America 62<sup>nd</sup> Annual Meeting, Portland, OR. 16-19 Nov. **T**
- *The effects of dietary exposure to the neonicotinoid clothianidin on Deformed Wing Virus titers in *Apis mellifera**. American Bee Research Conference, San Antonio, TX. 10-11 Jan. **P**
- 2012** *Hybrid breakdown leads to metabolic dysfunction in *Nasonia**. Social Insect Research Group Seminar, Arizona State University, Tempe, AZ. 9 Oct. **T**
- *Hybrid breakdown and mitochondrial function in *Nasonia parasitoid* wasps*. Evolution 2012 Meeting, University of Ottawa, Ottawa, Canada. 6-12 July. **T**
- *Hybrid breakdown and mitochondrial function in *Nasonia**. *Nasonia* Genome Meeting 2012, University of Cologne, Cologne, Germany. 3-5 June. **T**
- *The genetic basis of species' differences in a male sex pheromone in *Nasonia**. Social Insect Research Group Seminar, Arizona State University, Tempe, AZ. 14 March. **T**
- 2011** *Evolutionary dynamics of the oxidative phosphorylation pathway and hybrid breakdown in *Nasonia parasitoid* wasps*. Evolution 2011 Meeting, University of Oklahoma, Norman, OK. 17-21 June. **T**
- **Nasonia* male sex pheromone: genetics of species differentiation*. *Nasonia* Genome Meeting 2011, Vanderbilt University, Nashville, TN. 14-17 June. **T**
- *The little wasp that could... teach us about speciation*. Current Topics in Life Science (Grad student seminar), Arizona State University, Tempe, AZ. 28 Jan. **T**
- *Genetics of speciation – Hybrid Incompatibility in *Nasonia**. Social Insect Research Group Seminar, Arizona State University, Tempe, AZ. 26 Jan. **T**
- 2010** *Selection in the oxidative phosphorylation system and hybrid breakdown in *Nasonia parasitoid* wasps*. Evolution 2010 Meeting, Portland State University, Portland, OR. 25-29 June. **P**
- *Selection in the oxidative phosphorylation pathway and hybrid breakdown in *Nasonia parasitoid* wasps*. Graduates in Earth, Life and Social Sciences symposium, Arizona State University, Tempe, AZ. 26 Feb. **T**
- *Interactions between nuclear- and mitochondrial-encoded genes contribute to hybrid breakdown and may lead to speciation*. Social Biomimicry: conference (FILS), Arizona State University, Tempe, AZ. 18-20 Feb. **P**
- 2009** *Positive selection in the OXPHOS pathway and hybrid breakdown in *Nasonia**. *Nasonia* Genome Meeting 2009, University of Rochester, Rochester, NY. 7-9 Aug. **T**

- *Signatures of positive selection in nuclear encoded genes of the oxidative phosphorylation pathway in holometabolic insects.* 3<sup>rd</sup> Annual Arthropod Genomics Symposium: Frontiers in Arthropod Genomics. Organized by Kansas State University in Kansas City, MO. 11-14 June. **P**
- *Interacting Nuclear and Mitochondrial Genes in the Parasitoid Wasp, Nasonia: Positive Selection and Hybrid Incompatibility.* Social Insect Research Group Seminar, Arizona State University, Tempe, AZ. 23 Mar. **T**
- 2008** *Using a Genotyping Array to Reveal QTL for Mitochondrial OXPHOS Pathway Enzyme Efficiencies in Hybrids of Nasonia Parasitoid Wasps.* Nasonia Genome Meeting 2008. University of Edinburgh, Edinburgh, United Kingdom. 2-3 June. **T**
- *Using a Genotyping Array to Reveal QTL for Mitochondrial OXPHOS Pathway Enzyme Efficiencies in Hybrids of Nasonia Parasitoid Wasps.* 2nd Annual Arthropod Genomics Symposium: New Insights From Arthropod Genomes. Organized by Kansas State University in Kansas City, MO. 11-13 April. **P**

## **Professional meetings attended**

---

- Comparative Social Evolution Working Group Meeting, National Evolutionary Synthesis Center, Durham NC. 17-19 Feb. **2012**.
- Past-Present-Future of Ant Genomics. Center for Social Dynamics and Complexity, School of Life Sciences, Arizona State University, Tempe, AZ. 16-17 Jan. **2009**.
- Behavioural Ecology of Insect Parasitoids (BEPAR) Workshop: Genetic and Genomic Approaches for Parasitoid Behavioural Ecology. Institute of Evolutionary Biology, University of Edinburgh, Edinburgh, United Kingdom. 5-6 June **2008**.
- Asking questions with Genomes. Institute of Evolutionary Biology, University of Edinburgh, Edinburgh, United Kingdom. 4 June **2008**.
- 2nd *Nasonia* Genome Annotation and Assembly Meeting. Center for Social Dynamics and Complexity, School of Life Sciences, Arizona State University, Tempe, AZ. 31 May – 2 June **2007**.

## **Research Experience**

---

### **Postdoctoral Scholar**

October 2016 – November 2017

University of California, Berkeley, Department of Environmental Science, Policy, and Management  
P.I. Neil Tsutsui, Ph.D., Professor

Project: Genetic basis of cuticular hydrocarbons and olfactory reception in Argentine ants.

### **Postdoctoral Research Associate**

September 2013-September 2016

Purdue University, Department of Entomology

P.I.: Greg J Hunt, Ph.D., Professor

Project: Allele specific expression analysis of hybrid honey bees (European X Africanized).

### **Graduate Student, Biology Ph.D. program, Arizona State University**

September 2007-May 2013

Supervisor: Jürgen Gadau, Ph.D., Associate Professor

Project: Speciation genetics and hybrid incompatibility in *Nasonia* parasitoid wasps.

### **Laboratory Technician I and Lab Manager**

November 2004-May 2006

The Children's Hospital of Philadelphia

June 2006-August 2007

Arizona State University, School of Life Sciences

Supervisor: Kenro Kusumi, Ph.D., Assistant Professor of Pediatrics

Project: Formation of the axial skeleton and notch pathway regulation of the segmentation clock during somitogenesis.

### **Undergraduate Honors Research**

Fall 2003-Spring 2004

Loyola College in Maryland

Advisor: David B. Rivers, Ph.D., Associate Professor, Department of Biology

Project: Characterization of hemolymph and determination of toxicity of venom from Rosy-Haired Tarantulas (*Grammostola rosea*) in order to investigate autoimmunity to venom.

### **Work Study Research Assistant and Laboratory Technician**

Fall 2000-Spring 2004

Loyola College in Maryland, Department of Biology

Supervisor: Jennifer Scrafford, Department of Biology Academic Lab Manager

## **Professional Activities**

---

### **Professional Development**

Faculty Advancement, Success and Tenure, Purdue University

Fall 2013 - Spring 2014

Preparing Future Faculty Fellow, Arizona State University

April 2011

### **Peer reviewing**

Animal Behaviour, BMC Genomics, Entomologia Experimentalis et Applicata, Molecular Ecology Resources, PLoS One

### **Organization membership**

Entomological Society of America, 2014-present.

Indiana Academy of Sciences, 2014-2016.

Society for the Study of Evolution, May 2011-present.

Arthropod Professional Student Organization (officer), Arizona State University, 2011-2013.

## **Teaching and Mentoring Experience**

---

### **Teaching:**

**2018** General Biology for non-majors, Georgia Southern University.

**2012** Teaching Assistant, Comparative Social Evolution Seminar, Arizona State University  
This course utilized video conferencing to connect ASU with courses at Vanderbilt, Columbia and U.C. Berkeley.

**2010-2012** Teaching Assistant (3 semesters), General Entomology, Arizona State University.  
Coordinated all lab activities with one other TA.

**2008-2011** Teaching Assistant (3 semesters), Comparative Invertebrate Zoology, Arizona State University. Developed lab manual as well as coordinating all lab activities.

**2007** Teaching Assistant (1 semester), Human Anatomy and Physiology I (Fall 2007)

### **Mentoring:**

**Undergraduate laboratory supervision:** Supervised five undergraduates in the lab of Dr. Kusumi (2004-2007) and two undergraduates in Dr. Gadau's lab (2009-2013).

Honors Thesis Committee for Shoshanna Rutemiller (defense date, April 30, 2012)

### **Media**

---

Quanta Magazine, June 6, 2014. Interviewed for commentary on Brucker & Bordenstein, 2013.

ASU School of Life Sciences Graduate Student Newsletter, Spring 2013. Interviewed for "Spotlight on Success" about Niehuis, *et al.* (2013).

ASU press release for Niehuis, *et al.* (2013) release Feb 12, 2013, written with Sandra Leander. Featured on ASU news, Science Daily, Science Codex, Yahoo News and others. Translated into four languages.

Niehuis *et al.* (2013) covered independently by Science Magazine (Feb 13, 2013) and The Naked Scientists (Feb 19, 2013; [www.thenakedscientists.com](http://www.thenakedscientists.com))

### **Outreach**

---

Volunteer for Honey Bee exhibit and honey tasting at Purdue's Annual Bug Bowl. Nearly 30,000 people attend this weekend event each year. Purdue University, 2013-2016.

Guest speaker for BIO416/HPS410: Professional Values in Science to discuss authorship and peer review. Instructor: Karin Ellison (Jan. 24, 2012)

Graduate Student Representative on a departmental hiring committee for 3 Genomics faculty positions. 16 candidates were interviewed from a pool of over 250 applicants over two years. (Spring 2011-Spring 2012)

Lecture on Arthropods and Insects: Informational lecture for tour volunteers for the Dave Rogers Big Bugs exhibit. Desert Botanical Garden, Phoenix AZ. 26 Sept. 2011. 50 volunteers in attendance.

Current Topics in Life Sciences (BIO591) organizer (Fall 2010-Spring 2011): I was responsible for scheduling and advertising speakers as well as organizing lunch for this weekly seminar series with ~60 graduate students in attendance.

Exhibited insects for the Creepy Crawlies Wild Wednesday program. Tempe History Museum. 21 July 2010. 698 children and parents were in attendance.

SoLS Takes a Hike; expert in insects/invertebrates (April 2009, 2010, 2012)

Ask a Biologist; Invertebrate Zoology, Evolution and Genetics (2009-present)

Visiting Scholar Series, Preparing Future Faculty; Organized a graduate student breakfast with Dr. Alex Kaiser, Midwestern University (Oct 26, 2009)