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# Matthew R. Doremus

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## Education & Professional Appointments

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July 2022 – Present **Postdoctoral Researcher**

University of Kentucky

*Advisor:* Dr. Jen White

*Project Title:* Too hot to handle: How will the changing climate affect heritable symbionts of a generalist predator guild?

2021 – June 2022 **Postdoctoral Researcher**

University of Arizona

*Advisor:* Dr. Martha Hunter

*Project Title:* The saboteur's tools: mechanisms for host reproductive manipulation by the bacterial arthropod endosymbiont *Cardinium hertigii*

2016 – 2021

**PhD in Entomology and Insect Science,**

University of Arizona

*Advisor:* Dr. Martha Hunter

*Dissertation title:* *Cardinium*-induced cytoplasmic incompatibility in *Encarsia* parasitoid wasps

2014 – 2016

**Master's in Entomology,** University of Georgia

*Advisor:* Dr. Kerry Oliver

*Thesis title:* Friend or Foe? Characterization of the X-type symbiont in the pea aphid, *Acyrtosiphon pisum*

2010 – 2014

**B.S. in Biology, B.S. Environmental Science in Entomology,**

University of Georgia, graduated *cum laude*

## Fellowships and Grants

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2023 \$223,267

USDA-NIFA AFRI postdoctoral research grant

2019 \$592

Laurence Carruth Scholarship

2019 \$750

Research and Project Grant - UA Graduate & Professional Student Council

2016 \$11,511

UA Graduate Interdisciplinary Program in EIS in Recruiting Fellowship

## Awards

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2022		Speaker at Early Career Professional Recognition Symposium (ECPRS), ESA
2021		First Place, Student Competition – 10 minute paper presentations, ESA
2019	\$1325	R. F. Chapman Graduate Student Prize for Research in Insect Science
2018	\$600	Center for Insect Science (CIS) Travel Award
2018	\$400	Carter Travel Grant, UA Graduate & Professional Student Council
2017	\$600	CIS Travel Award
2017	\$600	Entomology and Insect Science (EIS) Program Travel Award
2016	\$500	UGA Outstanding Master's Student Award

## Publications

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1. **Doremus MR**, Stouthamer CM, Kelly SE, Schmitz-Esser S, Hunter MS. Quality over quantity: Unraveling the contributions to cytoplasmic incompatibility caused by two coinfecting symbionts. *Heredity*. 2022; 128: 187–195.  
DOI: <https://doi.org/10.1038/s41437-022-00507-3>
2. Schultz DL, Selberherr E, Stouthamer CM, **Doremus MR**, Kelly SE, Hunter MS, Schmitz-Esser S. Sex-based de novo transcriptome assemblies of the parasitoid wasp *Encarsia suzannae*, a host of the manipulative heritable symbiont *Cardinium hertigii*. *Gigabyte*. 2022; 2022:1-3.  
DOI: <https://doi.org/10.1101/2022.08.05.502955>
3. **Doremus MR**, Stouthamer CM, Kelly SE, Schmitz-Esser S, Hunter MS. *Cardinium* localization during its parasitoid wasp host's development provides insights into cytoplasmic incompatibility. *Frontiers in Microbiology* 2020;11:606399. DOI: [10.3389/fmicb.2020.606399](https://doi.org/10.3389/fmicb.2020.606399)
4. **Doremus MR** and Hunter MS. 2020. The Saboteur's tools: Common mechanistic themes across manipulative symbioses. In: *Advances in Insect Physiology: Mechanisms underlying microbial symbioses*. 58: 317-353. Ed: Oliver KM and Russell JA. Elsevier. DOI: [10.1016/bs.aiip.2020.03.003](https://doi.org/10.1016/bs.aiip.2020.03.003)
5. **Doremus MR**, Kelly SE, Hunter MS. 2019. Exposure to opposing temperature extremes causes comparable effects on *Cardinium* density but contrasting effects on *Cardinium*-induced cytoplasmic incompatibility. *PLoS Pathogens* 15(8):e1008022. DOI: [10.1371/journal.ppat.1008022](https://doi.org/10.1371/journal.ppat.1008022)
6. \***Doremus MR**, Kim KL, Holder AJ, Russell JA, & Oliver KM. 2018. Breakdown of a defensive symbiosis, but not endogenous defenses, at high temperatures. *J Molecular Ecology* DOI: [10.1111/mec.14399](https://doi.org/10.1111/mec.14399)  
*Cited 61 times*

7. Martinez AJ; **Doremus MR**; Kim KL; Oliver KM. 2018. Multi-modal defenses in aphids offer redundant protection and increased costs likely impeding a protective mutualism. *Journal of Animal Ecology* 87(2):464-477.  
doi: [10.1111/1365-2656.12675](https://doi.org/10.1111/1365-2656.12675).
8. \***Doremus MR** & Oliver KM. 2017. Aphid heritable symbiont exploits heritable mutualism. *Applied and Environmental Microbiology* 83:1-15.  
DOI: <https://doi.org/10.1128/AEM.03276-16>  
*Cited 56 times*
9. Gebiola M, Giorgini M, Kelly SE, **Doremus MR**, Ferree PM, Hunter MS. 2017. Cytological analysis of cytoplasmic incompatibility induced by *Cardinium* suggests convergent evolution with its distant cousin *Wolbachia*. *Proceedings of the Royal Society London, Series B*. 284.  
DOI: <https://doi.org/10.1098/rspb.2017.1433>
10. \*Martinez AJ, Ritter SG, **Doremus MR**, Russell JA, Oliver KM. 2014. Aphid-encoded variability in susceptibility to a parasitoid. *BMC Evolutionary Biology* 14:127. DOI: <https://doi.org/10.1186/1471-2148-14-127>  
*Cited 68 times*

Citation metrics (Google Scholar):

Total citations: 313

h-index: 8

i10-index: 8

## Presentations

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- 2023 **Doremus MR**, OL Mathieson, DL Shultz, S Schmitz-Esser, MS Hunter, M Kleiner. Of sperm and symbionts: Identification of candidate *Cardinium* CI factors by integrating symbiont cellular localization, CI modification timing, and protein expression. Oral presentation: International *Wolbachia* Conference, Chania, Greece.
- 2023 **Doremus MR**. Of sperm and symbionts: *Cardinium* localization during its parasitoid wasp hosts' development provides insights into cytoplasmic incompatibility. Oral Presentation: The 4<sup>th</sup> ISF Research Workshop on Symbiosis: Plasticity in Confronting Environmental Challenges. International Meeting. The Hebrew University of Jerusalem, Rehovot, Israel.  
*Invited talk.*
- 2022 **Doremus MR**, Stouthamer CM, Kelly SE, Schmitz-Esser S, and Hunter MS. *Cardinium*-induced cytoplasmic incompatibility in *Encarsia* wasps. Oral Presentation: Early Career Professional Recognition Symposium, Entomological Society of America, International Meeting. Vancouver, BC, Canada.
- 2021 **Doremus MR**, Stouthamer CM, Kelly SE, Schmitz-Esser S, and Hunter MS. Quality over quantity: Unraveling the contributions to cytoplasmic incompatibility

- caused by two coinfecting symbionts. Oral Presentation: Entomological Society of America, National Meeting. Denver, CO.
- 2020 **Doremus MR** and Hunter MS. Of sperm and symbionts: *Cardinium* localization during its parasitoid host's development has implications for *Cardinium*-induced CI. Oral Presentation: Entomological Society of America, National Meeting. Virtual.
- 2020 **Doremus MR** and Hunter MS. Of sperm and symbionts: *Cardinium* localization during its parasitoid host's development has implications for *Cardinium*-induced CI. Oral Presentation: International symbioses seminar series, organized by Greg Hurst, Univ. of Liverpool, and Nicole Gerardo, Emory University. Virtual.
- 2018 **Doremus MR**, Kelly SE, Hunter MS. The effects of temperature of *Cardinium*-induced CI in a parasitoid. Oral presentation: International *Wolbachia* Conference, Salem, MA.
- 2015 **Doremus MR** and Oliver KM. Does the X-type symbiont protect pea aphids, *Acyrtosiphon pisum*, from parasitism? Poster presentation: Entomological Society of America, National Meeting. Minneapolis, MN

## Teaching and Mentorship

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- 2019-20 TA ENTO 170C2 Secrets of Success: How insects conquered earth! (UA)  
Included guest lectures on insect predation/prey adaptations and facilitating small group discussions
- 2018 TA EIS 517 Insect Systematics (UA)  
Developed and led laboratory sessions on insect collection, identification, and preservation. Organized collecting trips, including a weekend-long trip to the Appleton-Whittell Research Ranch in Elgin, AZ
- 2018 TA ECOL 182L Introductory Biology II (UA)  
Led laboratory sections as sole instructor, including giving lectures on ecology and evolutionary biology prior to lab experiments
- 2017,2019 TA MCB 181L Introductory Biology I (UA)  
Led laboratory sections as sole instructor, including giving lectures on molecular and cellular biology prior to lab experiments
- 2015 TA BIOL 1104L Organismal Biology (UGA)
- 2014 TA BIOL 1103L Concepts in Biology (UGA)

## SERVICE AND OUTREACH

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**Academic Service** **Peer Reviewer** for Evolution, Microbial Ecology, Ecology and Evolution, Functional Ecology, IJSEM, Pest Management Science, Biological Control, Insects.

**Grant Reviewer** for Graduate and Professional Society Council Research and Project Grants.

**Host** for Henry Hagedorn Invited Speakers Dr. John McCutcheon (Arizona State University) and Dr. Alex Wild (University of Texas).

## Outreach

**Insect Discovery:** Elementary school program that brings researchers into classrooms, using live insects to engage with young students through inquiry-based learning. Developed an online model using live arthropods (hissing cockroaches, millipedes) and videos of *Encarsia* parasitoid development. Spring 2021, University of Arizona.

**Insect Festival:** Annual public event focused on insects and UA-based research hosting several thousand people. Volunteered at the “Life in Miniature” interactive booth. Host and panel member for “Talk with a Scientist: Graduate Research Panels.” Fall 2016-2019, University of Arizona.