

Ellen O. Martinson

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EDUCATION

Ph.D. Nov. 2012. University of Arizona, Department of Ecology and Evolutionary Biology. Advisors: A. Elizabeth Arnold and Jeremiah D. Hackett
B.A. May 2006 Concordia College, Major: Biology. Moorhead, MN

ACADEMIC APPOINTMENTS

2020-present Assistant Professor of Biology
Department of Biology, University of New Mexico, NM
2017-2019 Postdoctoral research associate.
Department of Entomology, University of Georgia, GA
Advisor: Michael R. Strand
2013-2017 Postdoctoral research associate.
Department of Biology, University of Rochester, NY
Advisor: John (Jack) H. Werren

PUBLICATIONS

Martinson EO, Chen K, Valzania L, Brown MR, Strand MR. 2021 Insulin-like peptide 3 stimulates hemocytes to proliferate in several species of obligately anautogenous and facultatively autogenous mosquitoes across Culicidae. Submitted.

Xiong X, Kelkar YD, Geden CJ, Zhang C, Wang Y, Jongepier E, Verhulst EC, Gadau J, **Martinson EO**, Werren JH, and Wang X. 2021. Long-read assembly and annotation of the parasitoid wasp *Muscidifurax raptorellus*, a biological control agent for filth flies. Accepted *Frontiers in Genetics*.

Martinson EO, Werren JH, Egan SP. 2021 Tissue-specific gene expression shows a cynipid wasp repurposes oak host gene networks to create a complex and novel parasite-specific organ. *Molecular Ecology* <https://doi.org/10.1111/mec.16159>.

Olafson PU, Aksoy S, Attardo GM, Buckmeier G, Chen X, Coates CJ, Davis M, Dykema J, Emrich SJ, Friedrich M, Holmes CJ, Ioannidis P, Jansen EN, Jennings EC, Lawson D, **Martinson EO**, Maslen GL, Meisel RP, Murphy TD, Nayduch D, Nelson DR, Oyen KJ, Raszick TJ, Ribeiro JMC, Robertson HM, Rosendale AJ, Sackton TB, Swiger SL, Sze SH, Tarone AM, Taylor DB, Warren WC, Waterhouse RM, Weirauch MT, Werren JH, Wilson RK, Zdobnov EM, JB. 2021 The genome of the stable fly, *Stomoxys calcitrans*, reveals potential mechanisms underlying reproduction, host interactions, and novel targets for pest control. *BMC Biology* 19 1-31. <https://doi.org/10.1186/s12915-021-00975-9>

Wang X, Kelkar Y, Xiong X, **Martinson EO**, Lynch J, Zhang C, Werren JW, Wang X. 2020 Whole genome sequence and annotation of the parasitoid jewel wasp *Nasonia giraulti* laboratory strain RV2X[u]. *G3: Genes, Genomes, Genetics* 10 (8), 2565-2572

- Scott, MJ, Benoit, JB, Davis, RJ, Bailey, ST, Varga, V, **Martinson, EO**, Hickner, PV, Syed, Z, Cardoso, GA, Torres, TT Weirauch, MT, Scholl EH, Phillippy AM, Sagel A, Vasquez M, Quintero G, Skoda SR. 2020 Whole genome sequence and developmental gene expression analyses of the New World screwworm. *Communications biology* 3 (1), 1-14
- Zhang J, Lindsey ARI, Peters R, Heraty JM, Hopper KR, Werren JH, **Martinson EO**, Woolley JB, Yoder MJ. 2020. Conflicted signal in transcriptomic markers leads to a poorly resolved backbone phylogeny of Chalcidoid wasps (Hymenoptera: Chalcidoidea). *Systematic Entomology*. <https://doi.org/10.1111/syen.12427>
- Martinson EO***, Peyton J*, Kelkar YD, Jennings EC, Benoit JB, Werren JH, and Denlinger DL. 2019. Genome and ontogenetic-based transcriptomic analyses of the flesh fly, *Sarcophaga bullata*. *G3: Genes, Genomes, and Genetics*. 9:1313-1320.
- Martinson EO**, Siebert AL, He M, Kelkar YD, Doucette LA, Werren JH. (2019) Evaluating the evolution and function of the dynamic Venom Y protein in ectoparasitoid wasps. *Insect Molecular Biology*. Doi: 10.1111/imb.12565.
- Egan SP, Hood GR, **Martinson EO**, and Ott JR. (2018) Quick guide: Cynipid gall wasps. *Current Biology*.28: PR1370-R1374. doi: 10.1016/j.cub.2018.10.028.
- Lindsey ARI, Kelkar YD, Wu X, Sun D, **Martinson EO**, Yan Z, Rugman-Jones PF, Hughes DST, Murali SC, Qu J, Dugan S, Lee SL, Hsu Chao H, Dinh H, Han Y, Doddapanelli HV, Worley KC, Muzny DM, Gibbs RA, Richards S, Yi SV, Stouthamer R, Werren JH (2018) Comparative genomics of the miniature wasp and pest control agent *Trichogramma pretiosum*. *BMC Biology* 16:54. doi: 10.1186/s12915-018-0520-9
- Martinson EO** and Werren JH. (2017) Venom is beneficial but not essential for development and survival of *Nasonia*. *Ecological Entomology*, 43: 146-153. doi: 10.1111/een.12480
- Martinson EO***, Mrinalini*, Kelkar Y, Chang C, Werren JH. (2017) The evolution of venom proteins by co-option of single copy genes. *Current Biology* 27: 2007-13. doi: 10.1016/j.cub.2017.05.032.
- Dispatches: Nicholas R. Casewell (2017) Evolution: Gene Co-option Underpins Venom Protein Evolution. Current Biology, 27: R647-R649*
- Catherine Griffin (2017) Wasp venom evolution. Science, 357:264-265.*
- Highlighted in: Science Magazine, Scientific American, Quanta Magazine, Futurity, Phys.org and ScienceDaily.*
- Cover image selected.*
- Martinson EO***, **Martinson VG***, Edwards R, Mrinalini, Werren JH. (2016) Laterally transferred gene recruited as a venom in parasitoid wasps. *Molecular Biology and Evolution* 33: 1042-1052. doi:10.1093/molbev/msv348.
- Martinson EO**, Hackett JD, Machado CA, Arnold AE. (2015) Metatranscriptome analysis of fig flowers provides insights into potential mechanisms for mutualism stability and gall induction. *PLoS ONE* 10(6): e0130745. doi:10.1371/journal.pone.0130745.
- Mrinalini, Siebert AL, Wright J, **Martinson E**, Wheeler D, Werren JH (2015) Parasitoid venom induces metabolic cascades in fly hosts. *Metabolomics* 11: 350-366. doi: 10.1007/s11306-014-0697-z.
- Martinson EO**, Wright J, Wheeler D, Mrinalini, Werren JH (2014) *Nasonia vitripennis* venom causes targeted gene expression changes in its fly host. *Molecular Ecology* 23: 5918-30.
- Martinson EO**, Jander KC, Peng YQ, Chen HH, Machado CA, Arnold AE, Herre EA (2014) Relative investment in egg load and poison sac in fig wasps: implications for physiological mechanisms underlying seed and wasp production in figs. *Acta Oecologica* 57: 58-66.

Martinson, EO, Herre EA, Machado CA, and Arnold AE (2012) Culture-free survey reveals diverse and distinctive fungal communities associated with developing figs (*Ficus* spp.) in Panama. *Microbial Ecology* 64: 1073-84.

FUNDING

- Pending: “How to manipulate a plant? Testing for conserved effectors and plant responses in gall induction and growth using a multi-species comparative approach” NSF Plant Biotic Interactions.
- Pending: UNM COBRE Center for Emerging Model Organisms
- NSF Graduate Research Fellowship Program (GRFP) Fellow (\$103,000), 2009-2011
- University of Arizona Graduate Student Association Travel Grant (\$500), May 2011
- Smithsonian Tropical Research Institute (STRI) Pre-doctoral Fellow (\$3000), 2009-2010
- Smithsonian Tropical Research Institute (STRI) Short-term Fellow (\$1000), 2008
- Evolutionary, Functional, and Computational Genomics-NSF IGERT Fellow (\$91,000), 2006-2008
- NSF Research Experience for Undergraduates (REU), Weber State University, Ogden, UT (\$3,000), 2005

TEACHING EXPERIENCE:

- UNM Biol 406 005 Emerging Model Organisms (3 Graduate and 16 undergraduate students)
- UNM Biol 304 Form and Function (160 undergraduate students)
- Guest lecture: Genome Assembly. Genetic Research (Bio 261W), University of Rochester, Department of Biology. 2015
- Course director: Journal Club in Ecology and Evolution (BIO 580), University of Rochester, Department of Biology. 2014
- Guest lecture: Population Regulation. Principles of Biology II (Bio 111), University of Rochester, Department of Biology. 2013
- Teaching Assistant: Evolution (ECOL 335), University of Arizona, EEB Department. 2011
- Teaching Assistant: Genetics (ECOL 320), University of Arizona, EEB Department. 2010
- Teaching Assistant: Ecology, Evolution, and Diversity (BIO 121), Concordia College, Biology Department. 2005-2006.

PRESENTATIONS

Talks:

1. Evolution and function of venom in parasitoid and gall wasps. Invited speaker. Feb 18, 2021. Department of Biology, University of Kentucky.
2. Evolution and function of venom in parasitoid wasps. Invited speaker. Feb 13, 2019. Department of Biology, University of New Mexico, Albuquerque, NM.
3. Evolution and function of venom in parasitoid wasps. Invited speaker. Feb 4, 2019. Department of Biological Sciences, North Dakota State University, Fargo, ND.
4. Regulation of immune cell proliferation is conserved in mosquitoes. Entomological Society of America Annual Meeting. Nov 14, 2018. Vancouver, BC.
5. Evolution and function of venom in parasitoid wasps. Invited speaker. Feb 5, 2018. Department of Entomology, University of Georgia, Athens, GA.
6. Cynipid galler induces massive gene expression changes in oak gall. Invited speaker. Entomological Society of America Annual Meeting. Nov. 7, 2017. Denver, CO.

7. Extended phenotypes of wasp venom from ectoparasitoids to gall-inducers. Invited speaker. April 27, 2017. Department of Biology, University of Alabama, Huntsville, Huntsville, AL.
8. Extended phenotypes of wasp venom from ectoparasitoids to gall-inducers. Invited speaker. March 24, 2017. Department of Entomology, Penn State, State College, PA.
9. Recruitment and evolution of parasitoid wasp venoms. Invited speaker. International Congress of Entomology. Sept. 27, 2016. Orlando, FL.
10. Evolution and function of venom in parasitic wasps. Invited speaker. Feb. 8, 2016. Department of Biology, Georgia Southern University, Statesboro, GA.
11. Evolution and host manipulation of *Nasonia* venom. Evolution Conference. June 21, 2014. Raleigh, North Carolina.
12. Investigating *Nasonia*'s venom host phenotype. Nasonia Conference. June 17, 2013. Wageningen, The Netherlands
13. Emergent traits in parasitoid-host interactions. Evo-Day 2013: Novel traits and rapid evolution May 6, 2013. Cornell University
14. Fungal communities associated with flowers of *Ficus* spp. in Panama. Congress of European Mycologists September 20, 2011. Halkidiki, Greece
15. Investigating mechanisms of gall induction in the fig-fig wasp system. Bambi Seminar Sept. 4, 2008. Barro Colorado Island, Panama
16. Molecular Survey of Brine Flies of the Great Salt Lake. Northern Plains Biological Symposium April 7, 2006. Fargo ND.
17. Spatial and Temporal Distribution of Mosquito Populations in the Red River Valley. Biology Honors degree presentation Dec. 2, 2004. Concordia College

Posters:

1. Laterally transferred gene recruited as a venom protein in parasitoid wasps. Gordon Research Conference: Ecological & Evolutionary Genomics. July 12-16, 2015. Biddeford, Maine.
2. Identification of Microflora Associated with Fig Wasps. Evolution. June 16-20, 2007. Christchurch, New Zealand.
3. Molecular Survey of Brine Flies of the Great Salt Lake. Sigma Xi Annual Student Conference. Nov 4, 2005. Seattle, Washington. Received a Superior Rating.

COMMITTEES SERVED

- UNM Graduate Committee Jordan Sampson 2020-
- UNM Graduate Committee Maya Allen 2020-
- UNM Graduate Committee Kevin McQuirk 2020-
- College of Science Graduate Student Council – member 2008-9
- Graduate Student Awards Reception Committee – member 2008-9

MENTORING

Graduate Students:

- | | |
|-----------------|--------------------|
| Daniel Hughes | 2020-2021 |
| Quin Baine | Starting fall 2021 |
| Elizabeth Solis | Starting fall 2021 |

Undergraduates:

- | | |
|-----------------|-------|
| Emily Casares | 2021- |
| Victoria Wilson | 2020- |

Lisa Garcia
Raven Zellers
Uyen-Trang Nguyen
Jillian Dunbar

2020-
Spring 2021
2020-Jan 2021
Summer 2019

OUTREACH

- Gall Research Course May 2021, Albuquerque High School Academy. Albuquerque, NM.
- Insectival, The State Botanical Garden of Georgia. September 15, 2018. Athens, GA
- Science Demonstration for Girl Scouts. March 10 & 24, 2015. Rochester, NY
- Insect Night for K-12. Aug. 19, 2011. Tucson, AZ.
- Reviewer for: *Proceedings of the Royal Society of London B*, *Journal of Molecular Evolution*, *Fonds Wetenschappelijk Onderzoek – Vlaanderen*, *BMC Microbiology*, *Arthropod-Plant Interactions*, *Acta Oecologica*, *Toxins*, *Ecology and Evolution*, *Pest Management Science*, *Journal of Molecular Evolution*, *Genomics*, *Current Biology*