

Martin Helmkamp

Curriculum Vitae

Personal Information

Position Assistant Research Scientist
Address Arizona State University
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Professional Experience

2012–present Assistant Research Scientist and Lab Manager, Arizona State University, United States
2009–2011 Postdoctoral Research Associate, Arizona State University, United States
2005–2009 Graduate Research Assistant, University of Hamburg, Germany
2003–2005 Undergraduate Research Assistant, University of Würzburg, Germany
2002 Intern, Max Planck Institute for Molecular Genetics in Berlin, Germany

Education

2009 *Doktor der Naturwissenschaften* (equivalent to Ph.D.), University of Hamburg, Germany
Graduated magna cum laude, advised by Dr. Bernhard Hausdorf
Thesis title: Molecular phylogenetic analysis of Bryozoa, Brachiopoda, and Phoronida
2005 *Diplom Biologie* (comparable to Master's degree in biology), University of Würzburg, Germany
Graduated with distinction, advised by Dr. Jürgen Gadau
Thesis title: Phylogeography and spatio-temporal population dynamics of the leaf-cutter ant *Atta colombica* in the Barro Colorado Nature Monument, Panama
2001 *Vordiplom Biologie* (German pre-degree in biology), University of Kassel, Germany
1998 *Abitur* (final German high school exam), Gymnasium Christian Ernestinum, Bayreuth, Germany

Research

Areas of Interest

Comparative and evolutionary genomics of social insects
Genetic and behavioral mechanisms underlying the evolution of sociality
Gene family evolution and the emergence of new genes
Colony structure, maternity and population genetics in ants
Phylogenetics and systematics

Techniques

Whole genome sequencing (Sanger, 454, illumina technology)
Gene expression studies (ESTs, quantitative PCR, RNAseq)
Bioinformatic analyses (comparative genomics, gene annotation, analysis of gene family evolution)
Phylogenetic inference (population to phylum-level, large-scale datasets)
Standard molecular genetic techniques (isolation of DNA and RNA, PCR, cloning, microsatellite fingerprinting)
Behavioral assays of division of labor
Biodiversity assessment

Mentorship

Supervision and training of ten undergraduate researchers in field work, molecular genetic techniques and phylogenetic inference. Two projects led to successful Honor's theses on the genetic structure in colonies of the honeypot ant *Myrmecocystus mendax* (Ti Huang Dang), and the recombination frequency in the genome of the harvester ant *Pogonomyrmex barbatus* (Neil Jacobson)

Related skills

Ability to run a research lab and fulfill a wide range of managerial and administrative responsibilities, including coordinating extensive experiments, maintenance and organization of lab space and materials, hazardous waste management, oversight of safety standards, supervision of animal care, archiving of research data and holding of regular meetings

Publications

15. Nesnidal M., Helmkamp M., Bruchhaus I., El-Matbouli M. and Hausdorf B. 2013. Agent of whirling disease meets orphan worm: phylogenomic analyses firmly place Myxozoa in Cnidaria. PLoS ONE 8: e54576
14. Wissler L., Gadau G., Simola D., Helmkamp M. and Bornberg-Bauer E. 2013. Mechanisms and dynamics of orphan gene emergence in insect genomes. Genome Biology and Evolution, early online access
13. Gadau J. and Helmkamp M. 2012. Ant(gen)omics – What we have and what we need! Myrmecological News 16: 67–68.

12. Nesnidal M., *Helmkampf M.*, Bruchhaus I. and Hausdorf B. 2011. The complete mitochondrial genome of *Flustra foliacea* (Ectoprocta, Cheilostomata) – compositional bias affects phylogenetic analyses of lophotrochozoan relationships. *BMC Genomics* 12: 572
11. Gadau J., *Helmkampf M.*, Nygaard S., Roux J., Simola D. F., Smith C. R., Suen G., Wurm Y. and Smith C. D. 2012. The genomic impact of 100 million years of social evolution in seven ant species. *Trends in Genetics* 28: 14–21
10. Smith C. R., Smith C. D., Robertson H., *Helmkampf M.*, et al. 2011. Draft genome of the red harvester ant *Pogonomyrmex barbatus*. *Proceedings of the National Academy of Sciences of the United States of America* 108: 5667–5672
9. Smith C. D., Zimin A., Holt C., ..., *Helmkampf M.*, et al. 2011. Draft genome of the globally widespread and invasive Argentine ant (*Linepithema humile*). *Proceedings of the National Academy of Sciences of the United States of America* 108: 5673–5678
8. Suen G., Teiling C., Li L., ..., *Helmkampf M.*, et al. 2011. The genome sequence of the leaf-cutter ant *Atta cephalotes* reveals insights into its obligate symbiotic lifestyle. *PLoS Genetics* 7: e1002007
7. Nesnidal M., *Helmkampf M.*, Bruchhaus I. and Hausdorf B. 2010. Compositional heterogeneity and phylogenomic inference of metazoan relationships. *Molecular Biology and Evolution* 27: 2095–2104
6. Hausdorf B., *Helmkampf M.*, Nesnidal M. and Bruchhaus I. 2010. Phylogenetic relationships within the lophophorate lineages (Ectoprocta, Brachiopoda and Phoronida). *Molecular Phylogenetics and Evolution* 55: 1121–1127
5. *Helmkampf M.*, Bruchhaus I. and Hausdorf B. 2008. Phylogenomic analyses of lophophorates (brachiopods, phoronids and bryozoans) confirm the Lophotrochozoa concept. *Proceedings of the Royal Society B* 275: 1927–1933
4. *Helmkampf M.*, Bruchhaus I. and Hausdorf B. 2008. Multigene analysis of lophophorate and chaetognath phylogenetic relationships. *Molecular Phylogenetics and Evolution* 46: 206–214
3. *Helmkampf M.*, Gadau J. and Feldhaar H. 2008. Population- and sociogenetic structure of the leaf-cutter ant *Atta colombica* (Formicidae, Myrmicinae). *Insectes Sociaux* 55: 434–442
2. Hausdorf B., *Helmkampf M.*, Meyer A., Witek A., Herlyn H., Hankeln T., Struck T. H. and Lieb B. 2007. Sphalian phylogenomics supports the resurrection of Bryozoa comprising Ectoprocta and Entoprocta. *Molecular Biology and Evolution* 24: 2723–2729
1. *Helmkampf M.*, Schwarz, C. J. and Beck J. 2007. A first look at the biodiversity of praying mantids (Insecta: Mantodea) in Sabah, Borneo. *Sepilok Bulletin* 7: 1–13

Selected presentations

- 2012 *Invited presentation:* Strategies of manual gene annotation
Quantitative Evolutionary and Comparative Genomics workshop, Okinawa, Japan
- 2011 *Invited presentation:* New genes and the evolution of social traits in ants
International Social Insect Genomics Research Conference, Shenzhen, China
- 2011 *Poster presentation:* Comparative analyses of seven ant genomes
5th Annual Arthropod Genomics Symposium, Kansas City, United States
- 2010 *Oral presentation:* The genetic basis of chemical communication – insights from an ant genome
103rd Annual Meeting of the German Zoological Society, Hamburg, Germany
- 2008 *Oral presentation:* Phylogenomic analyses firmly place lophophorates within Lophotrochozoa
10th Annual Meeting of the German Society for Biological Systematics, Göttingen, Germany
- 2007 *Oral presentation:* Phylogenomic analyses attest the resurrection of Bryozoa sensu lato
100th Annual Meeting of the German Zoological Society, Cologne, Germany

Memberships

International Union for the Study of Social Insects
Deutsche Zoologische Gesellschaft (German Zoological Society)
Gesellschaft für Biologische Systematik (German Society for Biological Systematics)

Language skills

German (native)
English (fluent)
French (basic)
Spanish (basic)