

# SARAH D. KOCHER

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## EDUCATION

**Ph.D., Genetics, 2009**  
North Carolina State University

**B.S., Integrative Biology, 2005**  
University of Illinois, Urbana-Champaign (UIUC)

## PROFESSIONAL EXPERIENCE

- 2015- **Associate Research Scholar**  
Lewis-Sigler Institute for Integrative Genomics  
Princeton University
- 2010-15 **Postdoctoral fellow**, Drs. Naomi Pierce & Hopi Hoekstra  
Department of Organismic and Evolutionary Biology  
Harvard University
- 2005-09 **Graduate Student**, Drs. Christina Grozinger & Trudy Mackay  
Department of Genetics  
North Carolina State University

## RESEARCH GRANTS

- 2013 *NSF IOS 1257543* (with N.E. Pierce), "The interplay of genes and ecology in the social behavior of a halictid bee"
- 2012 *USDA NIFA Postdoctoral Fellowship*, "The effects of a changing environment on populations of the native pollinator, *Augochlorella aurata*"
- 2011 *Putnam Expedition Grant* to collect Halictidae in the Palearctic (with N.E. Pierce), Harvard
- Research Council Grant*, University of Missouri, Columbia (with R. Cocroft), "Treehoppers as a quantitative genetic model for the evolution of maternal care."
- 2010 *FQEB Postdoctoral Fellowship*, Harvard "Why cooperate? The genetics and ecology underlying social evolution."
- Putnam Expedition Grant* to collect *Lasioglossum albipes* in France (with N.E. Pierce), Harvard
- FNRS Visiting Researcher fellowship*, University of Mons, Belgium

- 2009        *NSF Doctoral Dissertation Improvement Grant* (DDIG; with C.M. Grozinger), “The sociogenomics of pheromone response”
- 2008        *Sigma Xi Grant in Aid of Research*, “Variation in pheromone response and the maintenance of facultative sterility in worker honey bees”
- 2005-08     *NIH Graduate Student Fellowship* (NCSU Genetics Training Grant).

## PROFESSIONAL PUBLICATIONS

- Engel, P, Kwong, W, McFrederick, Q, Anderson, K, Barribeau, S, Angus Chandler, J, Cornman, S, Dainat, J, de Miranda, J, Doublet, V, Emery, O, Evans, J, Farinelli, L, Flenniken, M, Ganberg, F, Grasis, J, Gauthier, L, Hayer, J, Koch, H, **Kocher, S**, Martinson, V, Moran, N, Munoz-Torres, M, Newton, I, Paxton, R, Powell, R, Sadd, B, Schid-Hempel, P, Schmid-Hempel, R, Song, SJ, Schwarz, R, vanEngelsdorp, D, and Dainat, B. The bee microbiome: impact on bee health and model for evolution and ecology of host-microbe interactions. *In review*.
- Galbraith, DA, **Kocher, SD**, Glenn, T, Albert, I, Hunt, GJ, Strassmann, JE, Queller, DC and Grozinger, CM, 2016. Testing the kinship theory of intragenomic conflict in honey bees (*Apis mellifera*). *PNAS*, 201516636.
- Kapheim KM, Pan H, Li C, Salzberg SL, Puiu D, Magoc T, Robertson HM, Hudson ME, Venkat A, Fischman BJ, Hernandez A, Yandell M, Ence D, Holt C, Yocum GD, Kemp WP, Bosch J, Waterhouse RM, Zdobnov EM, Stolle E, Kraus FB, Helbing S, Moritz RF, Glastad KM, Hunt BG, Goodisman MA, Hauser F, Grimmelikhuijzen CJ, Pinheiro DG, Nunes FM, Soares MP, Tanaka ÉD, Simões ZL, Hartfelder K, Evans JD, Barribeau SM, Johnson RM, Massey JH, Southey BR, Hasselmann M, Hamacher D, Biewer M, Kent CF, Zayed A, Blatti C, Sinha S, Johnston JS, Hanrahan SJ, **Kocher SD**, Wang J, Robinson GE, Zhang G. (2015). Genomic signatures of evolutionary transitions from solitary to group living. *Science*, 348(6239), 1139-1143.
- Kocher, SD**, Tsuruda, JM, Gibson, JD, Emore, CM, Arechavaleta-Velasco, ME, Queller, DC, Strassmann, JE, Grozinger, CM, Gribskov, MR, San Miguel, P, and Westerman, R (2015). A search for parent-of-origin effects on honey bee gene expression. *G3: Genes | Genomes | Genetics*, 5(8), 1657-1662.
- Fu, F, **Kocher, SD**, Nowak, MA (2014). The risk-return tradeoff between solitary and eusocial reproduction. *Ecology Letters*, 18(1), 74-84.
- Kocher, SD\***, Pellissier, L\*, Veller, C, Purcell, J, Nowak, M, Chapuisat, M, and Pierce, NE. (2014). Transitions in social complexity along altitudinal gradients reveal a dual impact of climate on social evolution. *Proc Roy Soc B*. 281 (1787): 20140627.
- Kocher, SD** and Paxton, RJ. (2014). Comparative methods offer powerful insights into social evolution. Invited review, *Apidologie*, 45(3): 289-305.
- Kocher, SD\***, Li, C\*, Yang, W, Tan, H, Yi, SV, Yang, X, Hoekstra, HE, Zhang, G, Pierce, NE, Yu, DW. (2013). The genome of a socially polymorphic halictid bee,

*Lasioglossum albipes*. *Genome Biology* 14(12):R142.

**Kocher, SD** and Grozinger, CM. (2011). Cooperation, conflict, and the evolution of queen pheromones. *Journal of Chemical Ecology*, 37(11): 1263-75. **\*Reviewed in F1000**

Wang, Y., **Kocher, SD**, Linksvayer, TA, Grozinger, CM, Page, RE, and Amdam, GV. (2011). Regulation of behaviorally-associated gene networks in worker honey bee ovaries. *Journal of Experimental Biology*, 215(1): 124-134.

Chan QWT, Mutti NS, Foster LJ, **Kocher SD**, Amdam GV, Wolschin, F. (2011). The worker honeybee fat body proteome is extensively remodeled preceding a major life-history transition. *PLoS ONE* 6(9): e24794.

**Kocher, SD**, Ayroles, JF, Stone, EA, and Grozinger, CM. (2010). Natural variation in pheromone response correlates with reproductive traits and brain gene expression in worker honey bees. *PLoS ONE* 5(2): e9116.

**Kocher, SD**, Tarpy, DR, and Grozinger, CM. (2010). The effects of mating and instrumental insemination on honey bee flight behavior and gene expression. *Insect Molecular Biology*, 19(2): 153-162.

**Kocher, SD**, Richard, FJ, Tarpy, DR, and Grozinger, CM. (2009). Mating induces changes in honey bee queen mandibular gland profiles and ovary development. *Behavioral Ecology*, 20(5): 1007-1014.

**Kocher, SD**, Richard, FJ, Tarpy, DR, and Grozinger, CM. (2008). Genomic analysis of post-mating changes in the honey bee queen (*Apis mellifera*). *BMC Genomics*, 9:232.

## OTHER PUBLICATIONS

**Kocher, SD**. Bird bonding. (2010). *American Scientist* 99: 428. Book review.

**Kocher, SD**. From caterpillar to butterfly! (2014). *Booksy: Learn to Read Platform for K-2*. Tipitap Inc. (eBook).

**Kocher, SD**. Ants! (2014). *Booksy: Learn to Read Platform for K-2*. Tipitap Inc. (eBook).

**Kocher, SD**. Bees! (2014). *Booksy: Learn to Read Platform for K-2*. Tipitap Inc. (eBook).

## HONORS AND AWARDS

2012 International Congress of Entomology, Young Investigator Travel Award  
Entomological Society of America, Travel Award

2010 Kenneth R. Keller Award for Excellence in Doctoral Dissertation  
Research, NCSU

2009 Outstanding Talk Award, Genetics Graduate Student

Symposium, NCSU

2008 Graduate Student Association Travel Award recipient  
Graduate Student Professional Development Award

## TEACHING EXPERIENCE

2015 “Human Genomics: Past, Present, and Future”, Princeton.  
2012 Teaching Fellow, Cold Spring Harbor Course, “Programming for Biology”.  
2010 “Social behavior in Halictids.” Guest lecture for Evolution and Insect Societies, Pennsylvania State University  
2008 Teaching Assistant, Principles of Genetics, Honors section  
“Behavioral genetics.” Guest lecture for Principles of Genetics  
2007 Teaching Assistant, Principles of Genetics  
“Genes and Behavior.” Guest lecture for Principles of Genetics

## UNDERGRADUATE MENTORSHIP

2014-15 Li Murphy, Harvard University  
2012-14 Elizabeth Colbert, HCRP Research Award  
Abby Finkelstein, Brandeis University  
Jared Squires, HCRP Research Award  
Lauren Tomkinson, HCRP Research Award, MCZ Research Award  
2007-09 Sarah C. Jones, Undergraduate Research Award  
2005 Cynthia Rouf  
Kelly Hutcherson, Undergraduate Research Award

## INVITED TALKS (selected)

2016 International Congress of Entomology, Orlando, FL  
2016 Penn State, Entomology Seminar. State College, PA  
2015 Boston Population Genomics Supergroup, Broad Institute, Boston, MA  
2015 Cambridge Entomology Club, Cambridge, MA  
2015 University of New Hampshire, Durham, NH  
2014 Department of Biology, University of Missouri, Columbia, MO  
2014 Lewis Sigler Institute for Genomics, Princeton University, Princeton, NJ  
2014 Department of Biology, New York University, New York, NY  
2014 International Union for the Study of Social Insects, Cairns, Australia  
2013 Entomological Society of America, Austin, TX  
2012 Princeton University, Princeton, NJ  
2012 Entomological Society of America, Knoxville, TN  
2012 International Congress of Entomology, Daegu, Korea  
2011 University of Lausanne, Lausanne, Switzerland  
2011 International Conference on Social Insect Genomics. Shenzhen, China

## PROFESSIONAL SOCIETIES

American Society of Naturalists, Animal Behavior Society, Genetics Society of America, Entomological Society of America, International Union for the Study of Social Insects

## SERVICE AND OUTREACH

2015 "The curious behavior of bees", Guest Lecture on Monhegan Island, ME  
2014 "Ask the scientist" panelist, Young Women in Biology  
2013 Lecturer, AIM-UP! Research Coordination Network. "Evolutionary Genomics and the Museum"  
2012 Coordinator, Museum of Comparative Zoology Seminar Series  
2011 Insect Planet, Harvard Museum of Natural History annual outreach  
Coordinator, Museum of Comparative Zoology Seminar Series  
2010 Great Insect fair, Pennsylvania annual outreach program  
2007-09 President, Genetics Graduate Student Association  
2005-09 BugFest, annual community outreach program  
2007-08 GO NCSU, K-12 genetics outreach program  
2007 7<sup>th</sup> grade class outreach with Professor Pat Estes  
2006-07 Student-invited speaker rep., Genetics Graduate Student Association  
2005-07 Symposium organizer, Genetics graduate student research symposium  
2005 North Carolina School of Science and Math student research initiative