

Dr. Katharina Beer

Curriculum Vitae

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Scientific work experience:

PostDoc **since Dec. 2021**
University of Würzburg, Department of Behavioral Physiology and Sociobiology (ZooII)

PostDoc **Aug. 2019-Nov. 2021**
University of Würzburg, Department of Behavioral Physiology and Sociobiology (ZooII) in cooperation with the Department of Neurobiology and Genetics

PostDoc **Feb. 2018-July 2019**
University of Würzburg, Department of Neurobiology and Genetics

Research associate and PhD student **May 2013-Dec. 2017**
University of Würzburg, Department of Neurobiology and Genetics, within the CRC 1047 "Insect Timing"; project: "Characterization of the circadian clock in honey bees, solitary bees and aphids"

Teaching assistant **Oct.-Nov. 2012**
University of Würzburg, Department of Microbiology

Research assistant **Nov.-Dec. 2011**
University of Würzburg, Department of Microbiology, within the CRC 567, project: "Characterization of a symbiosis of intracellular bacteria and ants"

Academic degrees:

Dr. rer. nat. **Feb. 2018**
University of Würzburg, Department of Neurobiology and Genetics
Thesis title: "**A comparison of the circadian clock of highly social bees (*Apis mellifera*) and solitary bees (*Osmia spec.*)**"

M.Sc. Biology **May 2013**
University of Würzburg, main subjects: Microbiology and Animal Ecology
Thesis title: "**Development of a siRNA based method to experimentally manipulate the molecular clock of honey bees (*Apis mellifera*)**"

B.Sc. Biology **Feb. 2010**
University of Regensburg, main subject: Developmental Biology
Thesis title: "**The rhythmicity in activity of *Drosophila melanogaster* dependent on Morning- and Evening oscillator**"

Honors and awards:

- Presentation Award for Women Scientists** **Aug. 2024**
 At the XXVII International Congress of Entomology 2024
- SCIENCIA PostDoc Research Fellowship** **Aug. 2019-Nov. 2021**
 By the University of Würzburg; project: “Genetic manipulation of the circadian clock in honey bees (*Apis mellifera*) via CRISPR-Cas9 gene editing”
- PostDoc Career Development Fellowship** **Sept. 2018-Febr. 2019**
 By the DFG Excellence Initiative to the GSLS, University of Würzburg; project “Circadian rhythms and the clock network of social and solitary bees”
- Students’ representative** **May 2015 – Dec. 2017**
 In the CRC 1047 “Insect Timing”
- Merit Award** **May 2016**
 By the Society for Research on Biological Rhythms at the biannual meeting in Palm Harbor, USA, for the scientific merit based on the abstract “Comparison of the circadian clock of social and solitary bees”
- Travel Grant** **July 2014**
 By the Japanese Society for Chronobiology, at the Chronobiology Summer School 2014 in Sapporo, Japan

Research stay and summer school:

- Summer School** **Dec. 2015**
 By the Arizona State University and University of Würzburg, on “Frontiers in Insect Biology”, in Tempe, USA
- Summer School** **July 2014**
 By the Japanese Society for Chronobiology, in Sapporo, Japan
- Research stay** **June – Aug. 2010**
 At the National Parks and Wildlife Service, NSW, Australia; Field work project “Abundance and conservation of small vertebrates in the Sturt National Park”

Selected conference talks:

- “Timing matters – circadian clock development of social honey bees and solitary mason bees” at the meeting of the International Union for the Study of Social Insects, San Diego, California, USA, 2022
- “How does social life style affect the circadian system of young honey bees?” at the conference of the Society for Research on Biological Rhythms in Amelia Island, Florida, USA, 2022
- “Social vs. solitary - a comparison of the circadian clock in honey bees and mason bees” at the international branch meeting of the Entomological Society of America, virtual 2022
- “Manipulation of the circadian clock gene *Pigment Dispersing Factor* in honey bees via CRISPR-Cas9” at the meeting of the German Zoological Society in Würzburg 2021, Germany
- “How the clock develops: The PDF-network in honeybee brains of different developmental

stages” 11th Göttingen meeting of the German Neuroscience Society 2015

Selected conference posters:

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- “Manipulation of *pigment dispersing factor* gene in honey bees via CRISPR-Cas9” 85th Cold Spring Harbor Laboratory Symposium on Quantitative Biology: Biological Time Keeping, virtual 2021
- “What makes a clock “social”? Characterization of the circadian clock of honey bees (*Apis mellifera*) and red mason bees (*Osmia rufa*)” Chronobiology Gordon Research Conference 2015 in Girona, Spain
- “Development of a siRNA based method to experimentally manipulate the molecular clock of honey bees” Meeting of the European Biological Rhythms Society 2013 in Munich, Germany

Publications:

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- Roy, T., & Beer, K. (2024). Time memory in social insects with a special focus on honey bees. *Current Opinion in Insect Science*, 101327.
- Beer, K., Zupanc, G. K., & Helfrich-Förster, C. (2024). Ingeborg Beling and the time memory in honeybees: almost one hundred years of research. *Journal of Comparative Physiology A*, 210(2), 189-201.
- Beer K, Härtel S, Helfrich-Förster C (2022). The pigment-dispersing factor neuronal network systematically grows in developing honey bees. *J of Comparative Neurology*, 1-20.
- Colizzi FS, Beer K, Cuti, P, Deppisch, P, Martínez Torres, D, Yoshii, T, and Helfrich-Förster, C (2021). Antibodies against the clock proteins period and cryptochrome reveal the neuronal organization of the circadian clock in the pea aphid. *Front Physiol.* 2021;12:705048.
- Beer K, and Helfrich-Förster C (2020b). Model and non-model insects in chronobiology. *Front. Behav. Neurosci.* 14, 1-23.
- Beer K, and Helfrich-Förster C (2020a). Post-embryonic development of the circadian clock seems to correlate with social life style in bees. *Front. Cell Dev. Biol.* 8, 1-9.
- Beer K, Bloch G (2020). Circadian plasticity in honey bees. *The Biochemist*, 42, 22–26.
- Menegazzi P, Beer K, Grebler V, Schlichting M, Schubert F K, and Helfrich-Förster C (2020). A functional clock within the main morning and evening neurons of *D. melanogaster* is not sufficient for wild-type locomotor activity under changing day length. *Front. Physiol.* 11, 229.
- Beer K, Schenk M, Helfrich-Förster C, and Holzschuh A (2019). The circadian clock uses different environmental time cues to synchronize emergence and locomotion of the solitary bee *Osmia bicornis*. *Sci. Rep.* 9, 1, 17748.
- Beer K, Kolbe E, Kahana NB, Yayon N, Weiss R, Menegazzi P, Bloch G and Helfrich-Förster C (2018) Pigment-dispersing factor-expressing neurons convey circadian information in the honey bee brain. *Open Biology*, 8, 1, 170224.
- Beer K, Joschinski J, Arrazola Sastre A, Krauss J, and Helfrich-Förster C (2017). A damping circadian clock drives weak oscillations in metabolism and locomotor activity of aphids (*Acyrtosiphon pisum*). *Sci. Rep.* 7, 1, 14906.
- Fuchikawa T, Beer K, Linke-Winnebeck C, Ben-David R, Kotowoy A, Tsang VWK., Warman GR,

- Winnebeck EC, Helfrich-Förster C, and Bloch G (2017). Neuronal circadian clock protein oscillations are similar in behaviourally rhythmic forager honeybees and in arrhythmic nurses. *Open Biology*, 7, 6, 170047.
- Joschinski J, **Beer K**, Helfrich-Förster C, and Krauss J (2016). Pea Aphids (Hemiptera: Aphididae) Have diurnal rhythms when raised independently of a host plant. *J. Insect Sci.* 16, 31.
- Beer K**, Steffan-Dewenter I, Härtel S, and Helfrich-Förster C (2016). A new device for monitoring individual activity rhythms of honey bees reveals critical effects of the social environment on behavior. *J. Comp. Physiol. A* 202, 555–565.