

Institut für Biologie, 'Neurobiologie'

Freie Universität Berlin

**Dissertation zur Erlangung der Doktorwürde des Fachbereichs Biologie,
Chemie, Pharmazie der Freien Universität Berlin**

The Honeybee Olfactory System: 3-D Anatomy, Physiology and Plasticity

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vorgelegt von Sabine Krofczik aus Barwedel

- 1. Gutachter: Prof. Dr. Randolph Menzel**
- 2. Gutachter: PD Dr. Dagmar Malun**

This dissertation is based on the following manuscripts:

- I** Three-Dimensional Average-Shape Atlas of the Honeybee Brain and Its Applications.
by R. Brandt & T. Rohlfig & J. Rybak & S. Krofczik & A. Maye & M. Westerhoff & H.-C. Hege & R. Menzel
Journal of Comparative Neurology: 492, 1 - 19, cover.
- II** Functional and anatomical features of *Apis mellifera* olfactory interneurons.
by S. Krofczik & M. Nawrot & S. Stiller & R. Menzel
in prep.
- III** Age-, task- and experience-dependent structural plasticity in *Apis mellifera* olfactory microglomerular complexes.
by S. Krofczik & U. Khojasteh & N. Hempel de Ibarra & R. Menzel
Submitted to *The Journal of Neuroscience*.

The contributions of the different authors were as follows:

- I** R. Brandt and T. Rohlfig created the Atlas and wrote most of the manuscript. R. Rybak performed the backfill experiments and wrote parts of the manuscript. I performed the experiments from single neurons, developed with A. Maye the method to compose them within the Atlas, wrote parts of the manuscript, created the cover and the homepage. M. Westerhoff and H.-C. Hege belong to the Amira research group. The project was initiated and discussed with my supervisor R. Menzel who also wrote parts of the manuscript.
- II** I wrote the manuscript and produced all graphs. U. Khojasteh and myself performed the data analyses. N. Hempel de Ibarra and myself performed the experiments. I discussed the results with my supervisor R. Menzel.
- III** I am performed all experiments and I am writing the manuscript. N. Nawrot performed some analyses and produced some graphs. S. Stiller performed some programming. The results are discussed with my supervisor R. Menzel.