

Research Focus: Sensory Neuroscience 2024

The research area “Sensory Neuroscience” investigates the function of neural modules and networks and their association with perception and cognition. Molecular, cellular, physiological and evolutionary research approaches focus on the understanding of processes that control the transduction in sensory organs, and the signal pathways in and between cells, and which generate functional neural networks at different organizational levels and create behavioral patterns. Computational modeling will further deepen our understanding of these networks.

Linking these different levels of perception by multidisciplinary approaches is the challenging task of the research area “Sensory Neuroscience”.

The research area “Sensory Neuroscience” is at the core of the Research Center “Neurosensory Science” with a numerous basic research projects that are funded by national and international grant giving institutions. New technologies and up-to-date equipment (e.g. STED microscopy, optogenetics, MRI, MEG) provide unique facilities and experimental options for the integration of theoretical and clinical medicine, and the combination of physics, chemistry and computer science. Along this line, new research fields will be developed by means of structured programs.

The concept of the Collaborative Research Center (SFB) 1372 “Magnetic reception and navigation in vertebrates: from biophysics to brain and behavior” was developed from the two joint projects: second funding phase until September 30, 2022.

The concept of the Collaborative Research Center "Magnetoreception and navigation in vertebrates: from biophysics to brain and behavior" was developed from both collaborative projects: DFG Research Training Group "Molecular Basis of Sensory Biology" (GRK1885), Speaker: Prof. Karl-Wilhelm Koch, Duration: 20123 – 2023, and AFOSR Research Grant: "Cryptochrome-based magnetic sensing", Speaker: Prof. Peter Hore (Oxford), sub-projects of Prof. Henrik Mouritsen and Prof. Karl-Wilhelm Koch. The duration of the second funding period of the SFB is from 2023 to 2026. Extension applications for a third funding period is planned. Speaker: Prof. Henrik Mouritsen; further PIs from the field of sensory neuroscience: Profs. Dedek, Gerlach, Greschner, Koch, Lienau, Solov'yov and Winklhofer as well as Dr. Heyers. A Research Training Group (RTG) has also been integrated within the SFB since 2023.

Another endeavor within the scope of the research focus is to apply for a new Cluster of Excellence that researches the navigation abilities of animals. The project outline entitled “NaviSense” has already received positive reviews.

There is currently another DFG-funded Research Training Group: RTG 2783: “Neuromodulation of Motor and Cognitive Functions in Brain Health and Disease”, Speaker: Prof. Christiane Thiel, Duration 2022 to 2027.

Great synergy effects for the above SFB are also expected from the simultaneously launched ERC Synergy Grant "Quantum Birds" of Prof. Henrik Mouritsen and Prof. Peter Hore (Oxford).

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