

**Arbeitsgruppe: Neurobiologie des Hörens**  
**Ansprechpartner: Jannis Hildebrandt**

**Forschungsschwerpunkte und Interessen:**

- Auditory cortex function
- Adaptive coding and processing of auditory stimuli
- Animals models of aging or aspects of psychiatric pathologies effecting auditory perception
- Function and dynamics of (cortical) inhibition

Modellorganismen:

Mouse (different Cre-lines for expression in inhibitory neurons)

**Methoden:**

- Electrophysiology in awake-behaving animals (20-30 single units in parallel)
- Optogenetics
- Animal behavior / psychophysics
- Auditory brainstem recordings
- Immun-histochemistry / histology

**Ausgewählte Publikationen der letzten fünf Jahre**

1. **Hildebrandt KJ**, Ronacher B, Hennig RM, Benda J (2015) A Neural Mechanism for Time-Window Separation Resolves Ambiguity of Adaptive Coding . PLoS Biol 13 (3): e1002096.
2. Clemens J, Rau F, Hennig RM, **Hildebrandt KJ** (2015) Context-dependent coding and gain control in the auditory system of crickets. Eur J Neurosci,. doi: 10.1111/ejn.13019
3. Gonçalves PJ, **Hildebrandt KJ**, Linden JF , Sahani M (2015) Optogenetic modulation of transient and sustained response to tones in auditory cortex of awake mice. Computational and Systems Neuroscience 2015.
4. **Hildebrandt KJ**, Benda J, Hennig RM (2015) Computational themes of peripheral processing in the auditory pathway of insects. J Comp Physiol A 201 (1): 39–50.
5. **Hildebrandt KJ** (2014) Neural maps in insect versus vertebrate auditory systems. Curr Opin Neurobiol 24 (2): 82–87.

**(Angestrebte) Kooperationen/Projekte:**

Ongoing:

- Aging, peripheral hearing loss and inhibitory function in auditory cortex (project in H4all)
- Development of new strategies for auditory (mid-)brain implants (MHH/Laserzentrum Hannover)
- Computational role of inhibitory populations in auditory cortex (UCL London)

Would be interested in:

- Attentional modulation of inhibition (i.e. ACh) and effects on perception (human-animal)
- Cortical inhibition, brain oscillation and perception – use animal model to gain mechanistic insights
- Use of optogenetic techniques for better understanding of non-invasive large scales measures used in human subjects (EEG, MEG, fMRI)
- Work with animals models for aspects of psychiatric pathologies effecting auditory perception