Hanse-Wissenschaftskolleg
Institute for Advanced Study

Workshop

Descending Auditory Pathways:

Multidisciplinary Approaches to their Roles and Mechanisms

Delmenhorst, 03.-05. November 2025

OrganisatorInnen / Organizers:

Dr. Laurel H. Carney, University of Rochester, Rochester, NY, USA
Dr. Christine Köppl, Carl von Ossietzky Universität Oldenburg, DE
Dr. Go Ashida, Carl von Ossietzky Universität Oldenburg, DE

Gefördert durch / Funded by:

DFG Deutsche Forschungsgemeinschaft German Research Foundation
Demant
Johns Hopkins University
University of Rochester

Programm

Venue:

Hanse-Wissenschaftskolleg
Institute for Advanced Study
Lehmkuhlenbusch 4
27753 Delmenhorst
Tel: +49 4221 9160-100
www.hanse-ias.de
@HWK_IAS
@hanseias

Monday, 03. November 2025

09:30 – 09:40 **Introduction to the workshop**
Laurel Carney, University of Rochester (Rochester, NY, USA)

Day 1: Descending Pathways studied with Invasive Physiology

09:40 – 10:20 **Capturing the scene of efferent action on in situ outer hair cells**
Jong-Hoon Nam, University of Rochester (Rochester, NY, USA)

10:20 – 11:00 **An afferent auditory physiologist's encounters with the efferent system**
Tobias Moser, University of Göttingen (Göttingen, DE)

11:00 – 11.30 *KAFFEEPAUSE / COFFEE BREAK WITH POSTERS*

11:30 – 12:10 **Mapping inputs and activity of lateral olivocochlear neurons using genetic tools in mice**
Gabriel Romero, Harvard University (Cambridge, MA, USA)

12:10 – 12:50 **The impact of chloride homeostasis on development of LOC and LSO neurons**
Ivan Milenkovic, Carl von Ossietzky Universität Oldenburg (Oldenburg, DE)

12:50 – 13:50 *MITTAGESSEN / LUNCH*

13:50 – 14:50 ***POSTER SESSION***

14:50 – 15:30 **Introducing descending feedback loops in auditory models: where and how (and for what purpose)**
Go Ashida, Carl von Ossietzky Universität Oldenburg (Oldenburg, DE)

15:30 – 16:10 **Vestibular efferents: Using synaptic mechanisms to predict function**
J. Chris Holt, University of Rochester (Rochester, NY, USA)

16:10 – 16:40 *KAFFEEPAUSE / COFFEE BREAK WITH POSTERS*

16:40 – 17:20 [online talk] **Advanced approaches to dissect the role of the lateral efferent system in shaping auditory nerve fiber activity**
Philippe Vincent, Johns Hopkins University (Baltimore, MD, USA)

17:20 – 18:20 *Discussion Round - Summary of Day 1:*
What important questions remain unsolved?
How can we approach them using physiological techniques? How can we integrate the knowledge from the auditory and vestibular systems?

18:20 – 20:00 *ABENDESSEN / DINNER + DESSERT WITH POSTERS*

Tuesday, 04. November 2025

Day 2: Descending Pathways studied with Non-invasive Techniques

09:30 – 10:10	**Techniques for high-quality electrocochleography in humans: Assessment of auditory nerve and reflex function** *Skyler Jennings, University of Utah (Salt Lake City, UT, USA)*
10:10 – 10:50	**Using behavioral masking paradigms in humans to measure efferent effects** *Elizabeth Strickland, Purdue University (West Lafayette, IN, USA)*
10:50 – 11:30	*KAFFEEPAUSE / COFFEE BREAK WITH POSTERS*
11:30 – 12:10	**Investigating the potential role of olivocochlear efferents in adaptation to noise** *Enrique Lopez-Poveda, University of Salamanca (Salamanca, Spain)*
12:10 – 12:50	**Beyond the audiogram: High(er) throughput methods for measuring masking and behavior in noise in mouse models** *Amanda Lauer, Johns Hopkins University (Baltimore, MD, USA)*
12:50 – 14:00	*MITTAGESSEN / LUNCH*
14:00 – 15:10	***POSTER SESSION*** (+ Efferent Study Group Business Meeting)
15:10 – 15:50	**Efferent effects on DPOAE growth functions** *Shawn Goodman, University of Iowa (Iowa City, IA, USA)*
15:50 – 16:30	*KAFFEEPAUSE / COFFEE BREAK WITH POSTERS*
16:30 – 17:10	**A strategy to measure click-evoked otoacoustic emissions that reveal efferent responses during masking paradigms, in humans and awake rabbits** *Laurel Carney, University of Rochester (Rochester NY, USA)*
17:10 – 18:10	*Discussion Round - Summary of Day 2:* **What important questions remain unsolved? How can we bridge the observations with invasive and non-invasive techniques? How can we bridge the observations from animal and human (and model) studies?**
18:10 – 20:00	*ABENDESSEN / DINNER + DESSERT WITH POSTERS*

Wednesday, 05. November 2025

Day 3: Descending Pathways – Structure and Function

09:30 – 10:10	**Fast vestibular efferent action, a prelude to large self-generated head movements?** *Alan Brichta, University of Newcastle (Callaghan, Australia)*
10:10 – 10:50	**From cochlear synapse to system: Techniques for investigating MOC contributions to hearing and protection** *María Eugenia Gomez-Casati, University of Buenos Aires (Buenos Aires, Argentina)*
10:50 – 11:20	*KAFFEEPAUSE / COFFEE BREAK WITH POSTERS*
11:20 – 12:00	**Circuit architecture and axonal branching in the efferent auditory system** *Brett Schofield, Northeast Ohio Medical University (Rootstown, OH, USA)*
12:00 – 12:40	**Comparative anatomy of the peripheral olivocochlear efferent system: old challenges and new approaches** *Sonja Pyott, Carl von Ossietzky Universität Oldenburg (Oldenburg, DE)*
12:40 – 14:00	*MITTAGESSEN / Lunch*
14:00 – 14:40	**Efferent cochlear innervation in gerbils and birds: Challenges of immunohistochemistry on non-standard species** *Christine Köppl, Carl von Ossietzky Universität Oldenburg (Oldenburg, DE)*
14:40 – 16:00	*Discussion Round & Summary of Workshop:* **What important questions remain unsolved?** **How can we combine anatomical and physiological knowledge?** **How can we proceed with the current and future techniques?**

Poster Presentations

[1] **Origins of cholinergic input to superior olivary nuclei**
Dayanara Lohr, Brett Schofield (Northeast Ohio Medical University, OH, USA)

[2] **Contralateral noise-induced fluctuations in speech-evoked envelope following response timecourse**
Tan Ze Wang, Sriram Boothalingam, David Purcell (Western University, ON, Canada)

[3] **The middle ear muscle reflex in the Meddis model of the auditory periphery**
Mengchao Zhang, Tim Jürgens, Jacques Grange, John F Culling
(Aston University, UK / TH Lübeck, DE / Starkey, MN, USA / Cardiff University, UK)

[4] **Cross-species investigation of the mammalian olivocochlear efferent system**
Grace Capshaw, Hakim Hiel, Jane Mondul, Cynthia F Moss, Amanda M Lauer
(Johns Hopkins University, MD, USA)

[5] **Ideal-observer analysis of the effects of medial olivocochlear gain control on neural coding of sound level and amplitude modulation in quiet**
Daniel R Guest, Laurel H Carney (University of Rochester, NY, USA)

[6] **Mapping the descending projections of IC neuron types using viral tract tracing and light-sheet microscopy**
Elie DM Huez, Sarah Z Wajdi, Brett R Schofield, Michael T Roberts
(University of Michigan, MI, USA / Northeast Ohio Medical University, OH, USA)

[7] **Olivocochlear efferent feedback: Age-related changes in transmitter neurochemistry**
Friederike Könitz-Steenken, Christine Köppl (Carl von Ossietzky University Oldenburg, DE)

[8] **Purinergic modulation of acetylcholine release through P2Y receptors at the efferent - inner hair cells synapse in the developing cochlea**
Lucia Aguero, Facundo Alvarez-Heduan, Eleonora Katz, A. Belen Elgoyhen, Juan D Goutman
(INGEBI-CONICET, Argentina)

[9] **The inner ear's active process contributes to selective attention to speech in noise**
Janna Steinebach, Tobias Reichenbach (Friedrich-Alexander-Universität Erlangen-Nürnberg, DE)

[10] **Simulation of inner hair cells with tonotopic differences**
Daniela Schwarz, Go Ashida (Carl von Ossietzky University Oldenburg, DE)

[11] **Probing the role of lateral olivocochlear efferent innervation in afferent sound encoding**
Lejla Šoše, Nicola Strenzke, Lisa Goodrich, Tobias Moser
(University of Göttingen, Germany, DE / Harvard Medical School, MA, USA)

[12] **Dynamic modelling of the stapedius reflex**
Morgan Thienpont, Pauline Devolder, François Deloche, Sarah Verhulst (Ghent University, Belgium)

[13] **Characterizing medial olivocochlear (MOC)-mediated enhancement and its dependence on auditory and MOC stimulation parameters**
Choongheon Lee, J Chris Holt (University of Rochester, NY, USA)