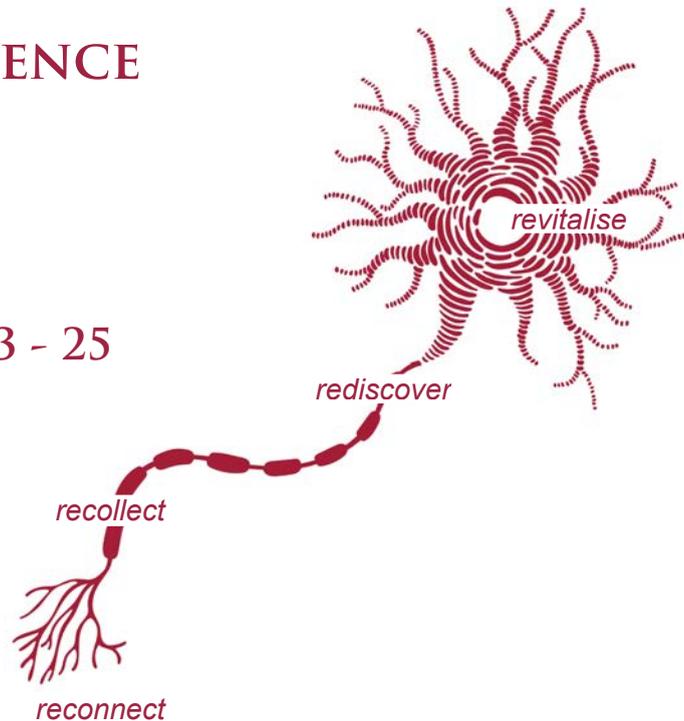




TÜBINGEN
NEUROSCIENCE
ALUMNI
MEETING
2018

SEPTEMBER 23 - 25
ALTE AULA



SPEAKERS
TALKS
ABSTRACTS

DAAD

SESSION I: BEHAVIOR, BEHAVIORAL DISORDERS & PSYCHIATRY

Chair: Horst Herbert

Sunday, Sep 23, 9:00 AM – 12:15 PM

SPEAKER

TITLE

ABSTRACT

Douglas Asede

Max Planck Florida Institute for Neuroscience,
Jupiter, USA

*Direct sensory input to amygdaloid
anterior paracapsular intercalated
cells modulates fear behaviors*

Characterization of amygdala circuits is important for understanding fear and other emotion-related behaviors. In this study, we show that a special cluster of cells in the amygdala preferentially receive direct fear-relevant inputs from auditory and somatosensory thalamic nuclei. Furthermore, we identified a subpopulation of cells that also inhibit principal neurons in the lateral amygdala, thereby modulating the integration of fear-related information. Together, these findings reveal a novel pathway for regulation of fear and other amygdala-dependent behaviors.

Francis Bambico

Memorial University of Newfoundland;
Centre for Addiction & Mental Health,
University of Toronto, Canada

*Swinging the mood towards novel
antidepressant mechanisms*

Moving beyond the classical monoamine mechanisms is a working strategy for antidepressant treatments development. We focus on cannabinoid receptors, SK-type potassium channels and somatostatin interneurons as potential 'druggable' targets for a more rapid and effective antidepressant response.

Pegah Sarkheil

Klinik für Psychiatrie, Psychotherapie und Psycho-
somatik, Uniklinik RWTH Aachen, Germany

*Resting-state functional connectivity
in phenotyping of psychiatric disorders*

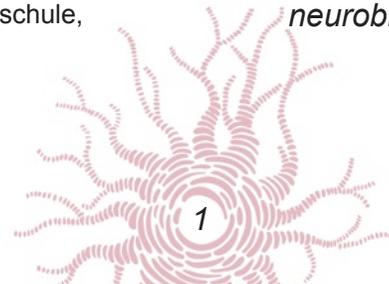
Investigating large-scale organization of the brain through resting-state functional connectivity MRI has a potential in the search for biomarkers of psychiatric disorders. A summary of relevant methods and key findings in psychiatry will be presented.

Anne Martinelli

School of Psychology, Fresenius Hochschule,
Frankfurt am Main, Germany

*Determining hostile intention in others:
neurobiology in aggressive children*

In this talk, I outline the neurobiology of attributing hostile intention to others in social interaction. The focus lies on the modulatory role of aggressive behavior and psychiatric disruptive behavior disorders in children and adolescents.



SESSION II: DECISION-MAKING, EXECUTIVE BEHAVIOR & LEARNING

Chair: Cornelius Schwarz

Sunday, Sep 23, 1:30 – 5:00 PM

SPEAKER

TITLE

ABSTRACT

Madison Carr

VU University, Amsterdam,
The Netherlands

*Impulsive decision-making with the lights OFF:
chemo- and optogenetic interrogation of the rodent
frontostriatal circuitry during discounting behavior*

The tendency to prefer smaller, more immediate rewards instead of waiting for a larger payoff that is more temporally postponed is a behavioral phenomenon known as 'delay discounting'. Highly-impulsive human subjects and rodents alike, typically exhibit steeper discounting and altered corticostriatal network activity. Using acute chemogenetic and optogenetic approaches, we examine how manipulation to corticostriatal excitability can influence choice preferences in a rodent model for impulsivity.

Chandramouli Chandrasekaran

Shenoy Lab, Stanford University, USA

*Neural population dynamics in the dorsal
premotor cortex during reach decisions*

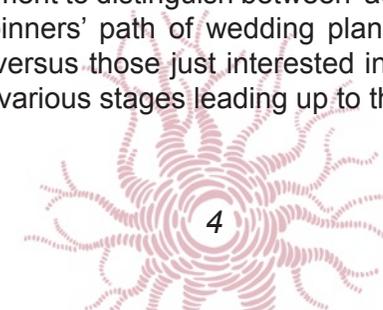
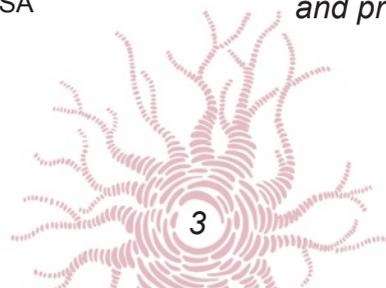
In this talk, I will present my research that combines behavioral modeling and analysis of neural population responses recorded in dorsal premotor cortex, a brain region thought to be involved in perceptual decisions to understand the dynamics underlying a reach decision.

Vanessa Singh

Pinterest, Insight Solution Team, USA

*Active consideration on Pinterest:
a multi-method approach to understanding
and predicting consumer behavior*

Discover how and why Pinterest uniquely fosters an 'active consideration mindset' and how we are measuring it. We are combining trends in search/saving behavior, users' stated preferences for leveraging the platform, and a controlled neuroscience experiment to distinguish between 'active considerers' and 'passive browsers'. The original research investigates pinners' path of wedding planning. It includes a comparison between people actively planning a wedding versus those just interested in weddings, and an understanding of the emotional/cognitive correlates of the various stages leading up to the big day.



SPEAKER

Todor Gerdjikov

Dept. of Neuroscience, Psychology and Behaviour,
University of Leicester, UK

TITLE

A corticostriatal network for attention in rats

ABSTRACT

Rodent striatum is involved in sensory-motor transformations and in behavior directed to salient reward-paired stimuli. In addition, prefrontal cortical inputs likely control these functions. We characterize this network in vivo by analyzing neuronal responses in pre-limbic cortex and striatal sub regions in rats trained in attentional tasks.

Shih-pi Ku

Dept. Functional Architecture of Memory,
Leibniz Inst. Neurobiol., Magdeburg, Germany

Error driven learning in entorhinal cortex and hippocampus premotor cortex during reach decisions

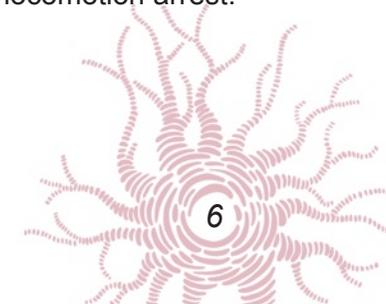
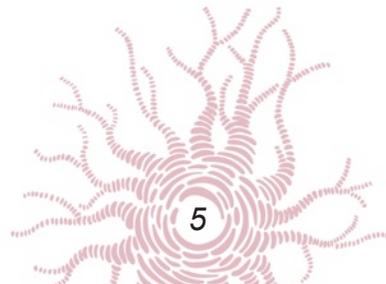
We tested the contribution of entorhinal cortex (EC) and hippocampus (HPC) in learning from errors by recording the two medial temporal structures as monkeys performed a task using an error-driven learning strategy. Error-detection signals were more prominent in the EC relative to the HPC. Early in learning, hippocampal but not EC neurons signaled error-driven learning by increasing their stimulus-selective responses following error relative to correct trials. After learning, both the EC and HPC signaled long-term memory with enhanced stimulus-selective responses. These results suggest strong and partially overlapping contributions of EC and HPC to learning from errors.

Vittorio Caggiano

IBM Research, Computational Neuroscience and
Multiscale Brain Modeling, Thomas J. Watson
Research Center, Yorktown Heights, USA

Should I stay or should I go: midbrain circuits for initiating, controlling and halting locomotion

Locomotion is an episodic motor behavior initiated and stopped according to behavioral needs. The precise activation of muscles is governed by neuronal networks in the spinal cord (Central Pattern Generators, CPGs) while commands for the activation of CPGs are integrated in the brainstem. In this presentation, I will describe new genetically identified populations of neurons in the brainstem responsible for initiation, context-dependent locomotor behaviors, and locomotion arrest.



SESSION III: SENSORY SYSTEMS – THE VISUAL & AUDITORY MODALITIES

Chair: Frank Schaeffel

Monday, Sep 24, 9:00 AM – 1:00 PM

SPEAKER

TITLE

ABSTRACT

Eleni Papageorgiou

Department of Ophthalmology,
University Hospital of Larissa, Greece

*Retinal and optic nerve changes in
human microcephaly: an optical
coherence tomography study*

Aim of this study was to investigate the morphology of the retina and optic nerve in microcephaly by means of non-invasive handheld optical coherence tomography (OCT). OCT abnormalities were found in 85% of patients. Patients had thinner retinæ and smaller optic discs. The retinal and optic nerve anomalies in microcephaly likely reflect retinal cell reduction and lamination alteration due to impaired neurogenic mitosis.

Weizhong Lan

Aier School of Ophthalmology, Central South
University; Aier Institute of Optometry and Vision
Science, Aier Eye Hospital Group, China

*An novel methodology to quantify
environmental risk factors of myopia*

In this talk, I will report on the development of a new methodology to quantify environmental risk factors of myopia. The experimental approaches combine smart technology as well as big data science.

Michael Ortiz

Institute of Neuroscience, Medical School,
Newcastle University, UK

*Visual network states during natural vision and
optogenetic stimulation in the macaque monkey*

During social interactions, our visual system gathers impressions of individuals, spatial relations and social actions. Such representations dependent on an oculomotor circuit that controls the direction of eye gaze on the visual scene. How the brain processes visual information during natural vision and how such processes engage the oculomotor system is in the focus of my research.

Amalia Papanikolaou

Institute of Behavioural Neuroscience, Experimental
Psychology, University College London, UK

*Interaction of adaptation states in the
primary visual cortex of awake mice*

Sensory pathways in the brain adapt to the current environment by adjusting neuronal responses to the recent history of stimulation. I will show, how changes in the environmental statistics affect neuronal responses in the primary visual cortex of awake mice over different timescales.

SPEAKER

Ceren Battal

Inst. Psychology & Inst. Neuroscience,
University of Louvain, Belgium

TITLE

Decoding auditory motion directions and locations in hMT+/V5 and planum temporale of sighted and blind individuals

ABSTRACT

We focused on the impact of early visual deprivation on auditory motion processing. Studying cross-modal plasticity sheds light on how sensory experience alters the functional organization of motion processing areas, and exploits intrinsic computational bias implemented in cortical regions.

Catherine Perrodin

Sir Henry Wellcome Fellow Institute of Behavioural Neuroscience, University College London, UK

I like the way you sing – socially-informative auditory cues in vocal sound patterns

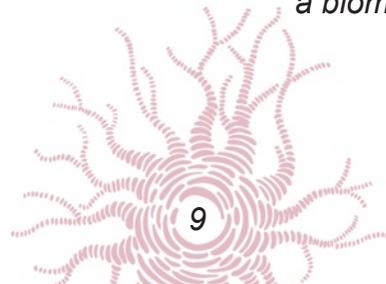
How does our brain enable us to communicate with each other? To answer this question, I study a natural social behavior in mice, in which females perceive and assess ultrasonic courtship 'love' songs produced by males for selecting a mating partner.

SESSION IV: NEUROLOGY & NEURODE(RE)GENERATION

Georgios Keliris

Dept. Biomedical Science,
University of Antwerp, Belgium

Dynamic MRI measurements as a biomarker of neurodegeneration



Chair: Horst Herbert

Tuesday, Sep 25, 9:00 AM – 12:15 PM

Neurodegenerative disorders present a huge burden to modern societies. Early detection by non-invasive measurements can thus provide hope for better therapeutic approaches and treatments. Dynamic MRI connectivity in combination with computational classification approaches provide a promising means for this endeavor. I will present some recent work we performed in rodents and give some future perspectives on combining this approach with rehabilitation strategies.



SPEAKER

Manuel M. Buitrago Blanco

Neurocritical Care, David Geffen School of Medicine at UCLA, Los Angeles, USA

TITLE

Neuro-vascular coupling in the neurological intensive care: Neuroscience applications

ABSTRACT

I will review key concepts of cerebral glucose metabolism, neurologic outcomes in clinical trials, the biology of the neurovascular unit and its involvement in secondary brain injury after traumatic brain insults, and current scientific and clinical data that demonstrate a better understanding of the biology of metabolic dysfunction in the brain, a concept now known as cerebral metabolic energy crisis. The use of neuromonitoring techniques to better understand the pathophysiology of the metabolic crisis and a model that summarizes the triphasic view of cerebral metabolic disturbances is addressed (Neurosurg Clin N Am 2016:453-463).

Janaky Coomaraswamy

Biogen Inc., Boston, USA

Amyloid spreading models: from bench to bedside

The concept of cell-to-cell propagation of pathogenic proteins in neurodegenerative disease has been a topic of intense research, particularly over the last decade. Several immunotherapies, approaches to limit pathogenic spread, are currently being tested in clinical trials.

Andrea Tedeschi

Wexner Medical Center, Ohio State University, Columbus, USA

Axon regeneration: are the processes of elongation and synapse formation at odds with one another?

Spinal cord injury (SCI) causes devastating neurological deficits due to axon regeneration failure. In exploring the mechanisms that control intrinsic axon growth ability, we discovered that *Cacna2d2* (a gene encoding a subunit of Cav-channels) functions as a developmental switch that limits axon growth and regeneration in adult neurons. Our findings provide novel insight into structural and functional reorganization of neuronal circuits, facilitating the design of translational research aimed at repairing the injured spinal cord.

Yao Zhang

Rare Diseases, Sanofi Genzyme

Restraint of presynaptic protein levels by Wnd/DLK signaling mediates synaptic defects associated with the kinesin-3 motor Unc-104

Kinesin-3 is required for axonal transport of many presynaptic components to synapses and mutation of this gene results in synaptic dysfunction in mice, flies and worms. We find that many synaptic defects in kinesin-3-null mutants are mediated independently of its transport function, via the Wallenda (*Wnd*)/DLK MAP kinase signaling pathway.

SESSION V: FROM ACADEMIA TO INDUSTRY

Chair: Siegried Wahl

Tuesday, Sep 25, 2:00 – 5:00 PM

SPEAKER

TITLE

ABSTRACT

Elvira Fischer

IMOTIONS – Biometric Research Platform,
Copenhagen/Berlin, Denmark/Germany

*Driving innovation through human
behavior research and emotion analytics*

How can we drive innovation into a meaningful and effective direction while utilizing innovation in technology and research? How do we decide if progressive approaches will be successful rather than a failing concept lead by possibility and not plausibility? Measuring emotional responses and non-conscious behavior is the key to understand the human experience of the world around us and in particular the interaction with the technology we are surrounded by. Let us explore together how quantifying human behavior and emotional responses through biometric measures can and will change the landscape of innovation and technology and how we can shape the future together.

Srinivasan Jayaraman

BASi – Bioanalytical Systems, Inc.,
West Lafayette, USA

*'Flying Westwards with Science' –
Application of specific in vivo pharmacological
platforms in drug discovery research*

I will share my life experience with all of you on what motivated me to be a Neuroscientist, how I ended up in Tübingen and how the graduate School and the University shaped my career and personal life. I will recollect and include some interesting events that happened after I left Tübingen as I progressed in my scientific career from academic labs to Industry. I will also talk about some key in vivo neuropharmacological platforms that I worked with and their application to drug discovery research.

Yashashree Joshi

Life Sciences Group,
Thermo Fisher Scientific, USA

*Bench to Business: Using transferable
skills developed at the bench & beyond
to run a multi-million dollar business*

Transferable skills developed at the bench & beyond are a huge asset in industry, be it as an application scientist helping other researchers or as a marketing manager managing a complex portfolio of products. Honing these transferable skills gained as a scientist and presenting them to the right audience can help gain a foot in the door. In this session, we can talk about transferable skills we all scientists possess but don't talk enough about as well as my personal motivation to move into industry as an application scientist and then about the vertical move into global marketing.



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2018

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