

CNB Newsletter

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Dear CNB members,

With the CNB Newsletter, we would like to inform you about upcoming CNB events and ongoing projects. This time we are further looking back to the Brainweek Bern 2017.

We are pleased to also introduce the research groups of Prof. Dr. med. Stefan Klöppel, PD Dr. Lucy Hathaway and PD Dr. Sebastian Walther in this edition.



Prof. Dr. Tobias Nef
President CNB

① CNB Annual Meeting 8. September 2017

The 12th CNB Annual Meeting with the topic „Neuroplasticity“ will take place on Friday, 8th of September 2017 in the Auditorium Ettore Rossi (Inselspital).

The program includes the keynote lectures of Prof. L. Jäncke (University of Zurich) and Prof. G. Courtine (EPFL). As in previous years, we again provide young researchers with the opportunity to present their ideas and research achievements by a short talk (selected from submitted abstracts) and/or during the poster

session. Further, four symposia on topics such as psychiatric and inflammatory diseases and regenerative neuroscience will be organized.

The preliminary program and registration form can be found on our homepage: www.neuroscience.unibe.ch

Submission deadline for abstracts (talks and poster) is the 6th of August 2017.

We hope to see you all on the 8th of September.

② Review: Brainweek Bern 2017

Clinical Neurosciences Bern are looking back on a very successful Brainweek 2017. The events were of great interest: The evening symposia and the movie night were very well-frequented. Please find enclosed some impressions of the different evenings. We are also pleased that the newly launched “CNB Science Slam” was of great success. We were overwhelmed by the high number of participants and are very grateful for all the different contributions during the evening as well as for the obtained feedback upon our survey afterwards. Thank you very much!

The next Brainweek Bern will take place from the 12th to the 16th of March 2018. The preliminary program and further information as well as all programs of past events can be found on the Brainweek homepage: www.brainweekbern.ch



Movie Night “Alzheimer”, 15. March 2017 – Brainweek Bern 2017



Symposium “Brain diseases”, 14. March 2017 – Brainweek Bern 2017



Opening Symposium, 13. March 2017 – Brainweek Bern 2017



CNB Science Slam, 15. March 2017 – Brainweek Bern 2017



Symposium “brain injury”, 16. March 2017 – Brainweek Bern 2017

Quelle: Insel Gruppe, Tanja Läser / Insel Gruppe, Kommunikation und Marketing / Stephan Gerber

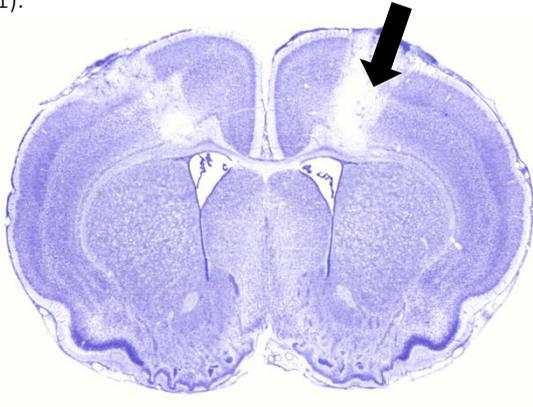
③ Selected Research Groups

PD Dr. L. Hathaway

*Pneumococcal Biology Lab
Institute for Infectious Diseases*



The Pneumococcal Biology Laboratory is focused on research on the human pathogen *Streptococcus pneumoniae*, a major cause of bacterial meningitis and pneumonia. One aspect of particular interest is the polysaccharide capsule surrounding the bacteria which determines the serotype. Capsule switch mutants have been generated to study the effect of serotype in disease. Working in close collaboration with the Neuroinfection Laboratory of the Institute for Infectious Disease with Prof. Stephen Leib and Dr. Denis Grandgirard has enabled study of the role of serotype in meningitis in the infant rat model. This has revealed that capsule type has a direct effect on meningitis severity (1).



*Arrow indicates cortical damage in the brain of a rat infected with *S. pneumoniae* serotype 6B*

This finding is the foundation of an SNF-funded project which will begin in July 2017 in collaboration with the National Institute for Communicable Diseases in South Africa to collect CSF samples from South African meningitis patients. We aim to use these samples to uncover the role that serotype plays in virulence of human pneumococcal meningitis.

- (1) Hathaway LJ, Grandgirard D, Valente LG, Täuber MG, Leib SL. *Streptococcus pneumoniae* capsule determines disease severity in experimental pneumococcal meningitis. *Open Biol.* 2016 Mar;6(3). doi: 10.1098/rsob.150269.

For more information, please contact:

*PD Dr. Lucy Hathaway
lucy.hathaway@ifik.unibe.ch
[homepage](#)
Friedbühlstrasse 51, 3001 Bern
+41 31 632 32 51*

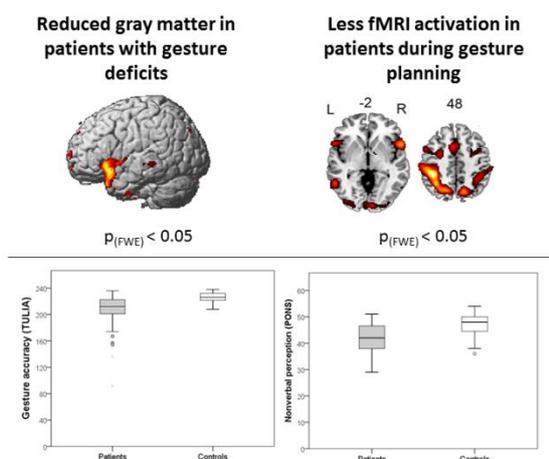
PD Dr. med. S. Walther

Communication Disorders in
Endogenous Psychoses
University Hospital of Psychiatry



The group of PD Walther consists of psychiatrists (e.g. Katharina Stegmayer, Tobias Bracht, Georgios Schoretsanitis, Andrea Cantisani, Lea Schäppi, Danaï Alexaki) and psychologists (Petra Viher) as well as a number of MD students. The main interest is to study psychopathological phenomena in schizophrenia and affective disorders that hamper communication. Methods include behavioral experiments, instrumental assessments, rating scales, noninvasive brain stimulation techniques and sophisticated structural and functional MRI.

Our main focus is on nonverbal communication skills such as hand gestures in schizophrenia. In a large SNF funded study we tested the course of gesture impairments, contributing psychopathological phenomena (e.g. formal thought disorder, delusions or motor abnormalities) as well as neurobiological correlates in the cortex and white matter tracts. We demonstrated a general impairment in producing and perceiving nonverbal stimuli in schizophrenia that increases with illness chronicity. Gesture impairments predicted poor outcome after 6-months in schizophrenia. Finally, structural and functional alterations in the cerebral praxis-network were linked to gesture impairments. Our group has published seminal papers on gesture in schizophrenia. The next endeavor will include an interventional trial targeting gesture in schizophrenia.



Further projects of our group include a double-blind randomized placebo-controlled trial of transcranial magnetic stimulation to improve psychomotor slowing in depression and schizophrenia. Here we tackle key areas of the motor system, in which we found functional alterations in previous studies. Also, we test white

matter properties associated with altered reward processing and motor slowing in depression. Furthermore, we explore correlates of poor motor control in psychoses as well as the neurobiology of catatonia, which resembles a critical movement disorder that may occur in various psychiatric disorders. In addition, we study the neurobiology of particular formal thought disorders. Finally, we investigate how perceived threat in paranoia may alter nonverbal behavior in terms of territorial safety behaviors, i.e. increased interpersonal distance. Together, these projects aim at understanding behavioral alterations in psychoses which impair successful communication. The ultimate goal is to establish interventions to help patients communicate effectively in order to regain social functioning.

Representative publications:

- Walther S, Stegmayer K, Sulzbacher J, ... Bohlhalter S (2015). Nonverbal social communication and gesture control in schizophrenia. *Schizophrenia Bulletin* 41(2): 338-345
- Stegmayer K, Bohlhalter S, Vanbellingen T, ... Walther S (2016). Structural brain correlates of defective gesture performance in schizophrenia. *Cortex* 78:125-137
- Walther S, Eisenhardt S, Bohlhalter S, ... Stegmayer K (2016). Gesture performance in schizophrenia predicts functional outcome after 6 months. *Schizophrenia Bulletin* 42(6):1326-1333
- Schoretsanitis G, Kutynia A, Stegmayer K, ... Walther S (2016). Keep at bay! – Abnormal personal space regulation as marker of paranoia in schizophrenia. *European Psychiatry* 31:1-7
- Walther S, Schäppi L, Federspiel A, ... Stegmayer K. Resting State Hyperperfusion of the Supplementary Motor Area in Catatonia. *Schizophrenia Bulletin* – in press
- Stegmayer K, Bohlhalter S, Vanbellingen T, ... Walther S. Limbic interference during social action planning in schizophrenia. *Schizophrenia Bulletin* – accepted

For more information, please contact:

PD Dr. med. Sebastian Walther
walther@puk.unibe.ch
[homepage](#)
Murtenstrasse 21, 3008 Bern
+41 31 632 88 41

Prof. Dr. med. S. Klöppel

Interventions in Cognitive Decline
University Hospital of Old Age Psychiatry



Arrived from Freiburg i. Br. a short while ago, this research group is headed by Prof. Dr. Stefan Klöppel and is primarily focused on investigating the use of multivariate machine learning techniques for an early diagnosis and prognosis of neurodegenerative disorders. More recently, we aim to modulate and optimize the therapeutic effect of cognitive training, which is deployed to counteract cognitive decline in the Memory Clinic Bern, through non-invasive brain stimulation methods, transcranial direct current stimulation (tDCS) and transcranial magnetic stimulation (TMS) in particular. While those techniques hold a lot of promise, thus far, their comprehensive clinical implementation is hampered by the observed large heterogeneity in stimulation benefits in the cognitive domain. Hence, two current studies are combining tDCS with MR functional neuroimaging and spectroscopy to explore the stimulation impact on the neurophysiological level. Apart from the recording of stimulation-induced changes in cortical activity and connectivity as well as neurotransmitter concentrations, we also explore the respective baseline measures as reliable biomarkers in patients to predict the individual therapeutic effect of tDCS. In the future, these insights will allow us to primarily target those patients with the highest likelihood to benefit from the treatment.

Representative publications:

- Vemuri P, Fields J, Peter J, Klöppel S. Cognitive interventions in Alzheimer's and Parkinson's diseases: emerging mechanisms and role of imaging. *Curr Opin Neurol.* 2016 Aug;29(4):405-11. doi: 10.1097/WCO.0000000000000346.
- Habich A, Canals S, Klöppel S. Tuning noninvasive brain stimulation with MRI to cope with intersubject variability. *Curr Opin Neurol.* 2016 Aug;29(4):453-8. doi: 10.1097/WCO.0000000000000353.
- Peter J, Lahr J, Minkova L, ..., Klöppel S. Contribution of the Cholinergic System to Verbal Memory Performance in Mild Cognitive Impairment. *J Alzheimers Dis.* 2016 Jun 18;53(3):991-1001. doi: 10.3233/JAD-160273.
- Klöppel S, Peter J, Ludl A, ..., Abdulkadir A. Applying Automated MR-Based Diagnostic Methods to the Memory Clinic: A Prospective Study. *Alzheimers Dis.* 2015;47(4):939-54. doi: 10.3233/JAD-150334.

For more information, please contact:

Prof. Dr. med. Stefan Klöppel
stefan.kloeppe@upd.ch
[homepage](#)
Murtenstrasse 21, 3008 Bern
+41 31 632 88 17

④ **Upcoming events**

8. September 2017	CNB Annual Meeting 2017 "Neuroplasticity"
12. - 16. March 2018	Brainweek Bern 2018

For any inquiries, please contact:

Romina Theiler
romina.theiler@insel.ch
+41 31 632 55 94