



Second LC imaging meeting Magdeburg

Thursday 12.12.2019

Coffee 9.00 – 9:30

Opening: 9.30-9.45

Data blitz 1: 9.45-10.15

Shelby Bachman, Martin Dahl, Kathy Liu, Max Dünnwald, Elisa Lancini (*LC integrity and cortical thickness, noradrenergic responsiveness & attention, age differences in LC integrity & cognition, alternative measures of NA function...*)

Session 1: 10.15 – 11:30 *What is the role and fate of the LC in neurodegenerative and clinical conditions? What makes the LC particularly vulnerable?*

- Luigi Zecca: *Neuromelanin and metals in locus coeruleus aging and neurodegeneration*
- Miquel Vila: *The role of neuromelanin in LC degeneration*
- Matthew Betts: *Locus Coeruleus imaging as a biomarker of neurodegeneration*
- Alexander Ehrenberg: *A locus for studying early vulnerability and behavioral changes in Alzheimer's disease*
- Luca Passamonti: *Noradrenergic deficit & restoration in progressive supranuclear palsy*

Discussion 11.30– 12.15 Chair: Matthew Betts & Mara Mather

Lunch break: 12.15-13.15

Session 2: 13.15-15.00 *How can we improve structural LC imaging?*

- Takashi Watanabe: *What makes LC visible in MRI?*
- Dimo Ivanov: *Unravelling the contributions to the neuromelanin-MRI contrast*
- Ben Inglis: *Relationships between T1 and MT using heuristic models of longitudinal relaxation: What could they mean for LC image contrast?*
- Rong Ye: *In vivo Probabilistic Atlas of Human Locus Coeruleus with Ultra-high Field 7T MRI*
- Maria Otaduy: *7T postmortem LC imaging at different stages*
- Evgeniya Kirilina & Kerrin Pine: *Iron-Induced MR Contrast in Human Locus Coeruleus: A Cautionary Tale of Misleading Post Mortem MRI Results*
- Nik Weiskopf: *Towards in vivo microstructural mapping of neuromelanin-rich nuclei*

Discussion 15.00 – 16.00 Chair: Ben Inglis & Dorothea Hämmerer

Coffee break 16.00-16.30

Session 3: 16.30 – 17.15 *Alternative ways of assessing the LC/NA system?*

- Michael Sommerauer: *Imaging noradrenaline transporters with 11C-MeNER PET in PD*
- Dorothea Hämmerer & Alex Yi: *What to keep in mind when using pupillometry and fMRI to look at LC function*
- Heidi Jacobs: *Linking NA-LC measures to Alzheimer's pathology*

Discussion 17.15-18.15 Chair: Heidi Jacobs & Luca Passamonti

Dinner at Hoflieferant 20.00



Friday 14.12.2019

Coffee 9.00 – 9.20

Data blitz 2: 9.20-10.00

Shubir Dutt, Marcus Grueschow, Gilles de Hollander, Anna Kabanova, Michael Kelberman, Ernesto Duran, Sanne Kaalund (*LC volume in Alzheimer's disease, choice conflict adjustments, pupillometry and switches in visual attention, noradrenaline and neuron development, modulation of cortical population dynamic by LC, LC loss in PSP...*)

Session 1: 10.00 – 11.30 *What have we learned (also from animal research) about the role of the LC in cognition and behavior over the last few years?*

- Mara Mather: *The role of the locus coeruleus in modulating attention*
- Gilles Vandewalle: *LC-vulnerability to Tau deposit, Alzheimer diseases and sleep-wake regulation*
- Johannes Bohacek: *The locus coeruleus under stress*
- Oxana Eschenko: *LC phasic activation: from local to global effects*
- Matthias Prigge: *Prefrontal top-down control of LC activity in mice*
- Klaus Ballanyi: *Neuromodulator-evoked pattern transformations of phase-locked non-synchronous locus coeruleus network spiking in newborn rat slices*

Discussion: 11.30 – 12.30 Chair: *Matthias Prigge & Oxana Eschenko*

Lunch break: 12.30-13.30

Session 2: 13.30 – 14.15 *What are promising interventions targeting the LC/NA system?*

- Christopher Madelung: *Ultra-high field MRI evaluation of locus coeruleus structure and function in Parkinson Disease*
- Paresh Malhotra: *The road to NorAD: Evaluating a Noradrenergic add-on therapy in patients with Alzheimer's Disease*
- Dorothea Hämmerer: *Upcoming stimulation and pharmacological studies in ageing and Alzheimer's disease*

Discussion: 14.15-15.15 Chair: *Michael Sommerauer & Kathy Liu*

Wrap up + future of the network: 15.15 – 15.30

Preparation for Hackathon & Animal chats

Coffee break 16.00 - 16.30

Dinner at COBA 20.00 & Whiskey in Café Central afterwards



Satellite event 1 *Animal chats* at the Leibniz Institute for Neurobiology (LIN)

Saturday 14.12.2019

Preparation: 9.30-10.30 (with coffee)

Introduction: 10.30 – 12.00

- Oxana Eschenko: *LC targeting for extracellular recording, stimulation and drug/virus injection*
- Klaus Ballanyi: Combined electrophysiological and imaging analysis of the complex locus coeruleus neuron-astrocyte network in newborn rat slices
- Takashi Watanabe: MRI & the LC

In the lab 1: 12.00-12.45

- Oxana Eschenko & Matthias Prigge: In vivo electrophysiology
- Discussion: potential and limitations

13.00 -14.00 Lunch break

In the lab 2: 14.00-15.30

- Klaus Ballanyi: Patch clamp electrophysiology, calcium imaging
- Takashi Watanabe / Miquel Villa / Frank Angenstein: Animal MR

Conclusion 15.30-16.00

Satellite event 2 *MR Hackathon* at the DZNE / 7T / 3T Scanner

Saturday 14.12.2019

9.30 Coffee at the LIN

9.30-11.00 Collect ideas /questions

11.00-13.00 First 3T MRI session

13.00-14.00 Lunch at the LIN

14.00-17.00 Second 3T MRI session

Sunday 15.12.2019

9.30 Coffee at the DZNE

10.00-10.30 Collect ideas /questions

10.30-13.00 Session at 7T

13.00-14.00 Lunch at the DZNE

14.00-15.00 Summary and future directions