Nikoloz **Sirmpilatze**

Postdoctoral Researcher

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Research Interest

I study the effects of anesthesia on brain function using functional Magnetic Imaging (fMRI) and *in vivo* 2-photon calcium imaging. I collect and analyze neuroimaging data from multiple mammalian species, including humans, various non-human primates and rats. I am particularly interested in the neural activity patterns that arise across various depths of anesthesia, either spontaneously or in reaction to stimulation.

Education

German Primate Center - Functional Imaging Lab

Göttingen, Germany

PhD in Neuroimaging — *May 2017 - Sep. 2021*

- *Thesis title:* Functional imaging of the anesthetized brain in primates and rodents
- *Supervisor:* Prof. Dr. Susann Boretius
- *Final grade:* Summa cum laude

Georg-August University of Göttingen - IMPRS for Neurosciences

Göttingen, Germany

MSc in Neuroscience — *Sep. 2015 - Apr. 2017*

- *Thesis title:* The temporal stability of BOLD fMRI measurements in medetomidine-anesthetized rats
- *Supervisor:* Prof. Dr. Susann Boretius
- *Final grade:* excellent 1.1 (1.0 down to 5.0)

Aristotle University of Thessaloniki

Thessaloniki, Greece

Doctor of Medicine (MD) — *Oct. 2009 - Jul. 2015*

- *Final grade:* excellent 9.43/10, top of the class of 2015 (valedictorian)

Advanced Courses & Workshops

Sep. 2019	**Brainhack Comparative MRI**, PRIME-DE Global Collaboration Workshop	*London, UK*
Feb. 2018	**Introduction to Data Science with python**, GGNB graduate school	*Göttingen, Germany*
May 2017	**Regression Modeling in R**, Leibniz Science Campus Primate Cognition	*Göttingen, Germany*
Nov. 2016	**Laboratory Animal Science Course on Primates**, European Primate Network (EUPRIM-NET)	*Göttingen, Germany*
Oct. 2016	**Laboratory Animal Science (FELASA Category B)**, Central Animal Facility, University Medical Center	*Göttingen, Germany*

Teaching Experience

Supervisor of students

Göttingen, Germany

German Primate Center - Functional Imaging Lab — *2018 - 2020*

- *Dmytro Nesterenko (MSc thesis):* Resting state connectivity and negative BOLD responses
- *Hanna Dubrovska (intern):* Ipsilateral negative BOLD response during the motor task in the HCP dataset
- *Anna Liashenko (intern):* Changes in resting state functional connectivity after the neurofeedback training of anterior midcingulate cortex (aMCC)

Teaching Assistant for *Introduction to MRI/fMRI*

Göttingen, Germany

IMPRS for Neurosciences MSc Program — *2017 - 2019*

- Gave tutorials and method courses on fMRI acquisition and analysis

Community Teaching Assistant for *Medical Neuroscience*

www.coursera.org

Online course offered by Duke University — *Jan. - Mar. 2013*

- Monitored student forums and answered questions

Teaching Assistant for *Neuroanatomy*

Thessaloniki, Greece

Laboratory of Descriptive Anatomy, Aristotle University Medical School — *Feb. - May 2011*

- Assisted during practical course on brain dissection

Academic Service

PRIME-RE (PRIMatE Resource Exchange)

Maintainer and contributor *Sep. 2019 - present*

- PRIME-RE is an open resource exchange platform for non-human primate neuroimaging: prime-re.github.io
- It is a community effort, initiated by the PRIME-DE (PRIMatE Data Exchange) consortium

Neurizons Conference

Organizer *2017 - 2020*

- Neurizons is a biennial student-organized neuroscience conference
- Was responsible for graphic design in 2018 and led the migration to an online format in 2020

Stipends & Awards

2019	**Magna cum Laude Merit Award & Educational Stipend**, 27th Annual Meeting of the ISMRM	*Montreal, Canada*
2017	**Student Support Program**, 34th Annual Meeting of the ESMRMB	*Barcelona, Spain*
2015	**Full MSc Student Scholarship**, German Academic Exchange Service (DAAD)	*Germany*
2010	**Undergraduate distinction**, Yearly Stipend from the State Scholarships Foundation of Greece (IKY)	*Greece*

Skills

MRI acquisition	Familiar with Bruker (Paravision) and Siemens Prisma platforms
MRI analysis	FSL, ANTS, nipype, Freesurfer, Connectome Workbench, AFNI, BrainVoyager, nilearn
Optical Methods	*In vivo* 2-photon calcium imaging
Programming	Python, R, Bash, git, LaTeX
Laboratory Animals	Rodent handling, anesthesia, surgery, stereotaxic injections
Languages	Greek (native), Georgian (native), English (fluent), German, Russian (intermediate proficiency)

Research Output

Peer-reviewed publications

1. **Sirmpilatze**, N., Baudewig, J. & Boretius, S. Temporal stability of fMRI in medetomidine-anesthetized rats. *Scientific Reports* **9,** 16673. doi:10.1038/s41598-019-53144-y (2019).
2. Messinger, A., **Sirmpilatze**, N., Heuer, K., Loh, K. K., Mars, R. B., Sein, J., Xu, T., Glen, D., Jung, B., Seidlitz, J., Taylor, P., Toro, R., Garza-Villarreal, E. A., Sponheim, C., Wang, X., Benn, R. A., Cagna, B., Dadarwal, R., Evrard, H. C., Garcia-Saldivar, P., Giavasis, S., Hartig, R., Lepage, C., Liu, C., Majka, P., Merchant, H., Milham, M. P., Rosa, M. G., Tasserie, J., Uhrig, L., Margulies, D. S. & Klink, P. C. A collaborative resource platform for non-human primate neuroimaging. *NeuroImage* **226,** 117519. doi:10.1016/j.neuroimage.2020.117519 (2021).
3. Hafner, G., Guy, J., Witte, M., Truschow, P., Rüppel, A., **Sirmpilatze**, N., Dadarwal, R., Boretius, S. & Staiger, J. F. Increased Callosal Connectivity in Reeler Mice Revealed by Brain-Wide Input Mapping of VIP Neurons in Barrel Cortex. *Cerebral Cortex.* bhaa280. doi:10.1093/cercor/bhaa280 (2020).
4. Lohrberg, M., Winkler, A., Franz, J., van der Meer, F., Ruhwedel, T., **Sirmpilatze**, N., Dadarwal, R., Handwerker, R., Esser, D., Wiegand, K., Hagel, C., Gocht, A., König, F. B., Boretius, S., Möbius, W., Stadelmann, C. & Barrantes-Freer, A. Lack of astrocytes hinders parenchymal oligodendrocyte precursor cells from reaching a myelinating state in osmolyte-induced demyelination. *Acta Neuropathologica Communications* **8,** 224. doi:10.1186/s40478-020-01105-2 (2020).

Preprints

1. **Sirmpilatze**, N., Mylius, J., Ortiz-Rios, M., Baudewig, J., Paasonen, J., Golkowski, D., Ranft, A., Ilg, R., Gröhn, O. & Boretius, S. Spatial signatures of anesthesia-induced burst-suppression differ between primates and rodents. *bioRxiv.* doi:10.1101/2021.10.15.464515 (2021).

Consortium publications

1. Milham, M. *et al.* Toward next-generation primate neuroscience: A collaboration-based strategic plan for integrative neuroimaging. en. *Neuron.* doi:10.1016/j.neuron.2021.10.015 (2021).
2. Milham, M. *et al.* Accelerating the Evolution of Nonhuman Primate Neuroimaging. *Neuron* **105,** 600–603. doi:10.1016/j.neuron.2019.12.023 (2020).

3. Gau, R. *et al.* Brainhack: Developing a culture of open, inclusive, community-driven neuroscience. *Neuron* **109,** 1769–1775. doi:10.1016/j.neuron.2021.04.001 (2021).

Conference Contributions

1. **Sirmpilatze**, N., Baudewig, J., Mylius, J., Golkowski, D., Ranft, A., Ilg, R., Paasonen, J., Gröhn, O. & Boretius, S. *fMRI mapping of anesthesia-induced burst suppression across multiple mammalian species* in *15th European Molecular Imaging Meeting (virtual).* **Talk** (2020).
2. **Sirmpilatze**, N., Baudewig, J., Mylius, J., Golkowski, D., Ranft, A., Ilg, R. & Boretius, S. *Using BOLD fMRI to map anesthesia-induced burst suppression in humans and non-human primates* in *27th Annual Meeting of the International Society for Magnetic Resonance in Medicine.* **Talk** (2019).
3. **Sirmpilatze**, N., Baudewig, J. & Boretius, S. *Are fMRI measurements in medetomidine-anesthetized rats temporally stable?* in *27th Annual Meeting of the International Society for Magnetic Resonance in Medicine.* **Poster** (2019).
4. **Sirmpilatze**, N., Baudewig, J., Kötz, K. & Boretius, S. *Optimizing medetomidine anesthesia for fMRI in rats* in *11th Forum of Neuroscience, Federation of European Neuroscience Societies.* **Poster** (2018).
5. **Sirmpilatze**, N., Baudewig, J., Kötz, K. & Boretius, S. *The temporal stability of BOLD fMRI measurements in medetomidine anesthetized rats* in *34th Annual Meeting of the European Society for Magnetic Resonance in Medicine and Biology.* **Poster** (2017).

Open Datasets

1. **Sirmpilatze**, N. & Klink, P. C. *RheMAP: Non-linear warps between common rhesus macaque brain templates* (Zenodo, 2020). doi:10.5281/zenodo.3786357.
2. **Sirmpilatze**, N., Baudewig, J. & Boretius, S. *Temporal stability of fMRI in medetomidine-anesthetized rats* (OpenNeuro, 2019). doi:10.18112/openneuro.ds001981.v1.0.3.

Open Code

1. **Sirmpilatze**, N. *niksirbi/pcarpet: Pre-release of pcarpet* version v.0.1.2. 2021. doi:10.5281/zenodo.5545696.
2. Klink, P. C. & **Sirmpilatze**, N. *PRIME-RE/RheMAP: RheMAP v1.4 "We are all individuals"* version v1.4. 2020. doi:10.5281/zenodo.3819979.

Invited Talks

1. *fMRI signatures of deep anesthesia in primates and rodents* in *Douglas Research Center CIC Seminar Series* (2021).