

## PERSONAL INFORMATION

Neumann, Wolf-Julian

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## • CURRENT POSITION

09/2024 Associate Professor for Invasive Neurotechnology  
2020 – 2024 Assistant Professor for Interventional and Cognitive Neuromodulation,  
Department of Neurology, Charité – Universitätsmedizin Berlin

## • EDUCATION

2011 – 2015 Doctoral dissertation – Dr. med. (summa cum laude), Department of Neurology,  
Charité – Universitätsmedizin Berlin, Berlin, Germany; Supervisor: Andrea A. Kühn  
2006 – 2013 Medical School, Charité – Universitätsmedizin Berlin, Berlin, Germany

## • LEADERSHIP

Since 2023 Executive Board of Directors, *Einstein Center for Neurosciences* (<https://www.ecn-berlin.de/>)  
Since 2023 Steering committee, Transregional Collaborative Research Consortium TRR295  
*ReTune: Retuning dynamic motor network disorders using neuromodulation*  
(<https://sfb-retune.de>)

## • PREVIOUS POSITIONS

2018 – 2020 Clinical resident in neuroradiology, Department of Neuroradiology, Charité –  
Universitätsmedizin Berlin; Director: Georg Bohner.  
2017 Visiting researcher, Department of Neurological Surgery, University of Pittsburgh,  
Pittsburgh, PA, USA; Director: R. Mark Richardson  
2015 – 2018 Post-doctoral research fellow in neurology, Department of Neurology, Charité –  
Universitätsmedizin Berlin. Director: Matthias Endres  
2015 Visiting researcher, Functional Imaging Laboratory, Institute of Neurology,  
University College London, London, United Kingdom

## • FELLOWSHIPS AND AWARDS

2023 – 2028 ERC Starting Grant, ERC-2022-STG ReinforceBG 101077060 - Interrogating basal  
ganglia reinforcement with deep brain stimulation in Parkinson's disease.  
2023 European Journal of Neuroscience, "Trailblazers in Neuroscience" award with  
dedicated review article and career portrait  
2020 – 2023 Fellow at Hertie Network of Excellence in Clinical Neuroscience, Hertie  
Foundation  
2020 – 2022 SPOKES Wellcome Trust Funded Translational Partnership Fellowship  
2019 Niels A. Lassen Prize, German Society for Clinical Neurophysiology and  
Functional Imaging (DGKN)  
2017 – 2022 Top Reviewer of the Year Award, four consecutive years, *Brain: A Journal of  
Neurology*  
2016 Ernst Reuter Prize 2016, best biomedical doctoral dissertation, FU Berlin  
2014 International Research Award, German Society for Clinical Neurophysiology and  
Functional Imaging (DGKN)  
2008 – 2009 Scholarship, Neurobiology Research Unit, Rigshospitalet, Copenhagen, Denmark

- **TEACHING ACTIVITIES**

- 2023 – now Graduate programme in Clinical Neurosciences, School of Mind & Brain, Berlin
- 2015 – now Programme organization, Medical Neuroscience, Charité Berlin
- 2024 Medical curriculum, Cerebellar signs and disorders in Neurology, Charité Berlin
- 2021 Virtual Reality for Neuroscience, Erfurt University, Germany
- 2017 – now Medical curriculum, eLearning development, gait disorders, Charité Berlin
- 2016 – 2017 Cognitive Neuroscience, NYU New York University, Berlin, Germany
- 2016 – 2017 Motor System & Movement Disorders, School of Mind and Brain, Berlin
- 2015 – now Medical curriculum, Dopamine and Parkinson's disease, Charité Berlin

- **ORGANIZATION OF SCIENTIFIC MEETINGS**

- 2023 International Basal Ganglia Society (IBAGS) Stockholm: Conference Organization
- 2022 Neural Control of Movement Dublin: Symposium organization
- 2022 DBS Expert Summit Würzburg: Conference Organization
- 2021 IEEE EMBS Conference on Neural Engineering: Symposium Organization
- 2020 Neural Control of Movement: Symposium organization
- 2018 Oxford-Berlin Motorneuroscience Berlin: Conference Organization.

- **REVIEW ACTIVITIES**

- 2020 - 2024 Grant reviews for Swiss National Science Foundation (SNSF), European Research Council (ERC), U.S. National Science Foundation (NSF), French National Research Agency (ANR), Netherlands Organisation for Health Research and Development (ZonMw), German Ministry of Research and Education (BMBF), German Research Foundation (DFG).
- 2015 – 2024 More than 100 invited peer reviews for Nature biomedical engineering, Nature Communications, Brain, JAMA Neurology, eLife, Annals of Neurology, and more.
- 2021 - 2024 PhD Reviewer for University of Oxford UK, University of Queensland AU, University of Maastricht NL and Charité – University Medicine Berlin.

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

- 2021 – now Council member, International Basal Ganglia Society (IBAGS)
- 2021 – now Member, diversity research network ALBA NETWORK, <https://www.alba.network/>

- **MAJOR COLLABORATIONS**

**Andrea A. Kühn**, Director of Movement Disorders and Neuromodulation, Charité – Universitätsmedizin Berlin, Berlin, Germany. Topics: Neurophysiology, Clinical Neurology.

**Hagai Bergman**, Simone and Bernard Guttman Chair in Brain Research, Edmond and Lily Safra Center for Brain Sciences at the Hebrew University of Jerusalem. Translational Neurophysiology.

**R. Mark Richardson**, Director of functional neurosurgery, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA. Topics: Brain computer interfaces for epilepsy and Parkinson.

**Timothy Denison**, Royal Academy of Engineering Chair in Emerging Technologies, University of Oxford, Oxford, UK. Topics: Hardware development and artifact management for brain implants.

**Philip Starr**, Director of functional neurosurgery, University of California San Francisco (UCSF), San Francisco, USA. Topics: Symptom decoding from home monitored brain implants.

**Andreas Horn**, Director of DBS Research, Department of Neurology, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA. Topics: BCI connectomics.

- **CURRENT AND PREVIOUS FUNDING AS PRINCIPAL INVESTIGATOR**

<i>Project Title</i>	<i>Funding source</i>	<i>Amount (Euros)</i>	<i>Funding period</i>
ERC Starting Grant ReinforceBG 101077060 - Interrogating basal ganglia reinforcement with deep brain stimulation in Parkinson's disease.	Horizon Europe	1,499,000 €	01.03.2022-28.02.2028
Deep Neural Network Approaches for Closed-Loop Deep Brain Stimulation Using Cortical and Subcortical Sensing	BMBF & NSF	1,022,491 €	01.03.2019 – 30.08.2024
Developing standards, infrastructure and workflows for computational analyses in neuromodulation research	DFG	833,600 €	01.07.2024 - 30.06.2028
Developing standards for data quality, reproducibility, and accessibility	DFG	690,300 €	01.06.2020 – 30.06.2024
Retuning pathway-specific neuronal population dynamics for movement initiation	DFG	624,940 €	01.07.2024 - 30.06.2028
Modulation of cortex – basal ganglia signaling for motor preparation in Parkinson's disease	DFG	515,700 €	01.07.2024 - 30.06.2028
Decoding therapy-related inhibition/disinhibition signaling through M1 ECoG and subthalamic LFP real-time classification in patients with Parkinson's disease	DFG	429,900 €	01.06.2020 - 30.06.2024
Berlin Institute of Health - Digital Health Accelerator: Deep Brain Decode	BIH	305,000 €	15.02.2024-30.09.2025
Hertie Network of Excellence in Clinical Neurosciences – Modulation of synaptic plasticity as a fundamental mechanism of basal ganglia function	Hertie	245,000 €	01.06.2020 – 31.05.2023
Seed funding: Rhythmic sampling of volitional actions – from motor control to pathophysiology of movement disorders	Hertie	60,000 €	01.05.2024 - 30.04.2026
From experiment to open metadata repository: Computational reproducibility for FAIR translational neuromodulation research in clinical neuroscience	BIH	25,000 €	01.06.2020 – 01.06.2022
		<b>6,250,931 € in 4 years</b>	

- **PUBLICATION METRICS (Google Scholar)**

77 publications (first/last author: 27), Impact factor of ~600: Citations: 5083; H-index: 40

- **SELECTED PUBLICATIONS**

Köhler RM, Binns TS, Merk T, ..., Haynes JD, [Neumann WJ](#). Dopamine and deep brain stimulation accelerate the neural dynamics of volitional action in Parkinson's disease. *Brain*. 2024 Oct 3;147(10):3358-3369.

[Neumann WJ](#), Horn A, Kühn AA. Insights and opportunities for deep brain stimulation as a brain circuit intervention. *Trends Neurosci*. 2023 Jun;46(6):472-487.

[Neumann WJ](#), Steiner LA, Milosevic L. Neurophysiological mechanisms of deep brain stimulation across spatiotemporal resolutions. *Brain*. 2023 Jul 14:awad239.

Yin Z, ..., Bergman H, [Neumann WJ\\*](#), Zhang J\*. Pathological pallidal beta activity in Parkinson's disease is sustained during sleep and associated with sleep disturbance. *Nat Commun*. 2023.

De Almeida Marcelino AL, Horn A, Krause P, Kühn AA, [Neumann WJ](#). Subthalamic neuromodulation improves short-term motor learning in Parkinson's disease. *Brain*. 2019;142(8):2198-2206.

[Neumann WJ](#), Schroll H, de Almeida Marcelino AL, et al. (2018) Functional segregation of basal ganglia pathways in Parkinson's disease. *Brain*. 2018 Aug 6. doi: 10.1093/brain/awy206.

[Neumann WJ](#) et al. (2015) Cortico-pallidal oscillatory connectivity in patients with dystonia. *Brain*.

[Neumann WJ](#) et al. (2014) Different patterns of local field potentials from limbic DBS targets in patients with major depressive and obsessive compulsive disorder. *Molecular Psychiatry*, |

- **COMPLETE PUBLICATION LIST**

**Preprint articles currently under peer review**

**Invasive neurophysiology and whole brain connectomics for neural decoding in patients with brain implants.** Merk T, Köhler R, Peterson V, Lyra L, Vanhoecke J, Chikermane M, Binns T, Li N, Walton A, Bush A, Sisterson N, Busch J, Lofredi R, Habets J, Huebl J, Zhu G, Yin Z, Zhao B, Merkl A, Bajbouj M, Krause P, Faust K, Schneider GH, Horn A, Zhang J, Kühn A, Richardson RM, Neumann WJ. Res Sq [Preprint]. 2023 Sep 20:rs.3.rs-3212709. doi: 10.21203/rs.3.rs-3212709/v1 *Second revision submitted to Nature biomedical engineering.* Methods relevant to the application: **Real-time neural signal decoding, human invasive high-resolution electrophysiology (ECoG, SEEG, DBS-LFP, RNS Neuropace), computational modeling of neural dynamics, MRI connectomics, machine learning approaches, responsive/closed-loop neuromodulation.** Brain disorders studied: **Parkinson's disease, Depression, Epilepsy**

**Shared pathway-specific network mechanisms of dopamine and deep brain stimulation for the treatment of Parkinson's disease.** Binns T, Köhler R, Vanhoecke J, Chikermane M, Gerster M, Merk T, Pellegrini F, Busch JL, Habets JGV, Cavallo A, Beyer J, Al-Fatly B, Li N, Horn A, Krause P, Faust K, Schneider GH, Haufe S, Kühn AA, Neumann WJ. bioRxiv preprint doi: <https://doi.org/10.1101/2024.04.14.586969> . *Revision submitted to Nature communications.* Methods relevant to the application: **Real-time neural signal decoding, human invasive high-resolution electrophysiology (ECoG, DBS-LFP), MRI connectomics, computational modeling of neural dynamics, DBS.** Brain disorders studied: **Parkinson's disease.**

**Peer-reviewed articles as first- or last author**

**Dopamine and deep brain stimulation accelerate the neural dynamics of volitional action in Parkinson's disease.** Köhler RM, Binns TS, Merk T, Zhu G, Yin Z, Zhao B, Chikermane M, Vanhoecke J, Busch JL, Habets JGV, Faust K, Schneider GH, Cavallo A, Haufe S, Zhang J, Kühn AA, Haynes JD, Neumann WJ. *Brain*. 2024 Oct 3;147(10):3358-3369. doi: 10.1093/brain/awae219. Methods relevant to the application: **neural signal decoding, human invasive high-resolution electrophysiology (ECoG, DBS-LFP), machine learning approaches, DBS.** Brain disorders studied: **Parkinson's disease**

**Cortical beta oscillations map to shared brain networks modulated by dopamine.** Chikermane M, Weerdmeester L, Rajamani N, Köhler RM, Merk T, Vanhoecke J, Horn A, Neumann WJ. *eLife* 13:RP97184, <https://doi.org/10.7554/eLife.97184.2>. Methods specific to the application: **human invasive high-resolution electrophysiology (ECoG, SEEG), MRI connectomics, molecular neuroimaging, computational modeling of neural dynamics.** Brain disorders studied: **Epilepsy.**

**Pathological pallidal beta activity in Parkinson's disease is sustained during sleep and associated with sleep disturbance.** Yin Z, Ma R, An Q, Xu Y, Gan Y, Zhu G, Jiang Y, Zhang N, Yang A, Meng F, Kühn AA, Bergman H, Neumann WJ\*, Zhang J\*. *Nat Commun*. 2023 Sep 5;14(1):5434. doi: 10.1038/s41467-023-41128-6. \*shared senior author. Methods relevant to the application: **human invasive high-resolution electrophysiology (ECoG, DBS-LFP), responsive/closed-loop neuromodulation.** Brain disorders studied: **Parkinson's disease.**

**Neurophysiological mechanisms of deep brain stimulation across spatiotemporal resolutions.** Neumann WJ, Steiner LA, Milosevic L. *Brain*. 2023 Nov 2;146(11):4456-4468. doi: 10.1093/brain/awad239. Review. Methods relevant to the application: **human invasive high-resolution electrophysiology (ECoG, DBS-LFP, multiunit recordings), responsive/closed-loop neuromodulation.** Brain disorders studied: **Parkinson's disease, dystonia, Essential tremor.**

**Insights and opportunities for deep brain stimulation as a brain circuit intervention.** Neumann WJ, Horn A, Kühn AA. *Trends Neurosci*. 2023 Jun;46(6):472-487. doi: 10.1016/j.tins.2023.03.009. Review. Methods relevant to the application: **human invasive high-resolution electrophysiology (MEG, ECoG, DBS-LFP, Multiunit recordings), MRI connectomics, responsive/closed-loop neuromodulation.** Brain disorders studied: **Parkinson's disease, dystonia.**

**Adaptive Deep Brain Stimulation: From Experimental Evidence Toward Practical Implementation.** Neumann WJ, Gilron R, Little S, Tinkhauser G. *Mov Disord*. 2023 Jun;38(6):937-948. doi: 10.1002/mds.29415. Review. Methods relevant to the application: **human invasive high-resolution electrophysiology (ECoG, DBS-LFP), responsive/closed-loop neuromodulation.** Brain disorders studied: **Parkinson's disease.**

**Christmas-Related Reduction in Beta Activity in Parkinson's Disease.** Feldmann LK, Lofredi R, Al-Fatly B, Busch JL, Mathiopoulou V, Roediger J, Krause P, Schneider GH, Faust K, Horn A, Kühn AA, Neumann WJ. *Mov Disord.* 2023 Apr;38(4):692-697. doi: 10.1002/mds.29334. **Methods relevant to the application: human invasive high-resolution electrophysiology (Medtronic Percept), MRI connectomics.** **Brain disorders studied: Parkinson's disease.**

**Movement decoding using spatio-spectral features of cortical and subcortical local field potentials.** Peterson V, Merk T, Bush A, Nikulin V, Kühn AA, Neumann WJ\*, Richardson RM\*. *Exp Neurol.* 2023 Jan;359:114261. doi: 10.1016/j.expneurol.2022.114261. \*Shared senior authorship **Methods relevant to the application: neural signal decoding, machine learning approaches, human invasive high-resolution electrophysiology (ECoG, DBS-LFP).** **Brain disorders studied: Parkinson's disease**

**A practical guide to invasive neurophysiology in patients with deep brain stimulation.** Neumann WJ, Köhler RM, Kühn AA. *Clin Neurophysiol.* 2022 Aug;140:171-180. doi: 10.1016/j.clinph.2022.05.004. Review. **Methods relevant to the application: human invasive high-resolution electrophysiology (ECoG, DBS-LFP).**

**Electrocorticography is superior to subthalamic local field potentials for movement decoding in Parkinson's disease.** Merk T, Peterson V, Lipski WJ, Blankertz B, Turner RS, Li N, Horn A, Richardson RM, Neumann WJ. *eLife.* 2022 May 27;11:e75126. doi: 10.7554/eLife.75126. **Methods relevant to the application: neural signal decoding, human invasive high-resolution electrophysiology (ECoG, DBS-LFP), computational modeling of neural dynamics, machine learning approaches.** **Brain disorders studied: Parkinson's disease.**

**Machine learning based brain signal decoding for intelligent adaptive deep brain stimulation.** Merk T, Peterson V, Köhler R, Haufe S, Richardson RM, Neumann WJ. *Exp Neurol.* 2022 May;351:113993. doi: 10.1016/j.expneurol.2022.113993. Review. **Methods relevant to the application: real-time neural signal decoding, human invasive high-resolution electrophysiology (ECoG, DBS-LFP), computational modeling of neural dynamics, machine learning approaches, responsive/closed-loop neuromodulation.** **Brain disorders studied: Parkinson's disease, Essential tremor.**

**The sensitivity of ECG contamination to surgical implantation site in brain computer interfaces.** Neumann WJ, Memarian Sorkhabi M, Benjaber M, Feldmann LK, Saryyeva A, Krauss JK, Contarino MF, Sieger T, Jech R, Tinkhauser G, Pollo C, Palmisano C, Isaias IU, Cummins DD, Little SJ, Starr PA, Kokkinos V, Gerd-Helge S, Herrington T, Brown P, Richardson RM, Kühn AA, Denison T. *Brain Stimul.* 2021 Sep-Oct;14(5):1301-1306. doi: 10.1016/j.brs.2021.08.016. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP, Medtronic Percept, RNS Neuropace), DBS, computational modeling of neural dynamics, responsive/closed-loop neuromodulation, translational engineering.** **Brain disorders studied: Obsessive compulsive disorder, Tinnitus, Parkinson's disease, Dystonia**

**Pallidal low-frequency activity in dystonia after cessation of long-term deep brain stimulation.** Scheller U, Lofredi R, van Wijk BCM, Saryyeva A, Krauss JK, Schneider GH, Kroneberg D, Krause P, Neumann WJ\*, Kühn AA\*. *Mov Disord.* 2019 Nov;34(11):1734-1739. doi: 10.1002/mds.27838. \*Shared senior authorship **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP, Medtronic PC+S).** **Brain disorders studied: Dystonia**

**Subthalamic neuromodulation improves short-term motor learning in Parkinson's disease.** de Almeida Marcelino AL, Horn A, Krause P, Kühn AA, Neumann WJ. *Brain.* 2019;142(8):2198-2206. **Methods relevant to the application: MRI connectomics, DBS.** **Brain disorders studied: Parkinson's disease.**

**Toward Electrophysiology-Based Intelligent Adaptive Deep Brain Stimulation for Movement Disorders.** Neumann WJ, Turner RS, Blankertz B, Mitchell T, Kühn AA\*, Richardson RM\*. *Neurotherapeutics.* 2019;16(1):105-118. \*equal contribution. Review. **Methods relevant to the application: real-time neural signal decoding, human invasive high-resolution electrophysiology (ECoG, DBS-LFP), computational modeling of neural dynamics, machine learning approaches, responsive/closed-loop neuromodulation.** **Brain disorders studied: Parkinson's disease, Essential tremor, Dystonia.**

**Functional segregation of basal ganglia pathways in Parkinson's disease.** Neumann WJ, Schroll H, de Almeida Marcelino AL, Horn A, Ewert S, Irmen F, Krause P, Schneider GH, Hamker F, Kühn AA. *Brain.* 2018 Sep 1;141(9):2655-2669. doi: 10.1093/brain/awy206. **Methods relevant to the application: computational modeling of neural dynamics, MRI connectomics, DBS.** **Brain disorders studied: Parkinson's disease**

**Pallidal and thalamic neural oscillatory patterns in tourette's syndrome.** Neumann WJ, Huebl J, Brücke C, Lofredi R, Horn A, Saryyeva A, Müller-Vahl K, Krauss JK, Kühn AA. *Ann Neurol.* 2018 Oct;84(4):505-514. doi: 10.1002/ana.25311. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP).** **Brain disorders studied: Tourette's syndrome**

**A localized pallidal physiomer in cervical dystonia.** Neumann WJ, Horn A, Ewert S, Huebl J, Brücke C, Slentz C, Schneider GH, Kühn AA. *Ann Neurol.* 2017 Dec;82(6):912-924. doi: 10.1002/ana.25095. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP). Brain disorders studied: Dystonia**

**Long term correlation of subthalamic beta band activity with motor impairment in patients with Parkinson's disease.** Neumann WJ, Staub-Bartelt F, Horn A, Schanda J, Schneider GH, Brown P, Kühn AA. *Clin Neurophysiol.* 2017 Nov;128(11):2286-2291. doi: 10.1016/j.clinph.2017.08.028. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP, Medtronic PC+S). Brain disorders studied: Parkinson's disease**

**Subthalamic synchronized oscillatory activity correlates with motor impairment in patients with Parkinson's disease.** Neumann WJ, Degen K, Schneider GH, Brücke C, Huebl J, Brown P, Kühn AA. *Mov Disord.* 2016 Nov;31(11):1748-1751. doi: 10.1002/mds.26759. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP). Brain disorders studied: Parkinson's disease**

**Deep Brain Recordings Using an Implanted Pulse Generator in Parkinson's Disease.** Neumann WJ, Staub F, Horn A, Schanda J, Mueller J, Schneider GH, Brown P, Kühn AA. *Neuromodulation.* 2016 Jan;19(1):20-24. doi: 10.1111/ner.12348. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP, Medtronic PC+S). Brain disorders studied: Parkinson's disease**

**Cortico-pallidal oscillatory connectivity in patients with dystonia.** Neumann WJ, Jha A, Bock A, Huebl J, Horn A, Schneider GH, Sander TH, Litvak V, Kühn AA. *Brain.* 2015 Jul;138(Pt 7):1894-906. doi: 10.1093/brain/awv109. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP, MEG). Brain disorders studied: Dystonia**

**Deep brain stimulation suppresses pallidal low frequency activity in patients with phasic dystonic movements.** Barow E\*, Neumann WJ\*, Brücke C, Huebl J, Horn A, Brown P, Krauss JK, Schneider GH, Kühn AA. *Brain.* 2014 Nov;137(Pt 11):3012-3024. doi: 10.1093/brain/awu258. Epub 2014 Sep 10. PMID: 25212852; PMCID: PMC4813762. \*Shared first authorship **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP), responsive/closed-loop neuromodulation . Brain disorders studied: Dystonia**

**Different patterns of local field potentials from limbic DBS targets in patients with major depressive and obsessive compulsive disorder.** Neumann WJ, Huebl J, Brücke C, Gabriëls L, Bajbouj M, Merkl A, Schneider GH, Nuttin B, Brown P, Kühn AA. *Mol Psychiatry.* 2014 Nov;19(11):1186-92. doi: 10.1038/mp.2014.2. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP). Brain disorders studied: Depression, Obsessive compulsive disorder**

**Enhanced low-frequency oscillatory activity of the subthalamic nucleus in a patient with dystonia.** Neumann WJ, Huebl J, Brücke C, Ruiz MH, Kupsch A, Schneider GH, Kühn AA. *Mov Disord.* 2012 Jul;27(8):1063-6. doi: 10.1002/mds.25078. **Methods relevant to the application: human invasive high-resolution electrophysiology (DBS-LFP). Brain disorders studied: Dystonia**

## Peer reviewed articles as co-author

**Proceedings of the 11th Annual Deep Brain Stimulation Think Tank: pushing the forefront of neuromodulation with functional network mapping, biomarkers for adaptive DBS, bioethical dilemmas, AI-guided neuromodulation, and translational advancements.** Johnson KA, Dosenbach NUF, Gordon EM, Welle CG, Wilkins KB, Bronte-Stewart HM, Voon V, Morishita T, Sakai Y, Merner AR, Lázaro-Muñoz G, Williamson T, Horn A, Gilron R, O'Keefe J, Gittis AH, Neumann WJ, Little S, Provenza NR, Sheth SA, Fasano A, Holt-Becker AB, Raike RS, Moore L, Pathak YJ, Greene D, Marceglia S, Krinke L, Tan H, Bergman H, Pötter-Nerger M, Sun B, Cabrera LY, McIntyre CC, Harel N, Mayberg HS, Krystal AD, Pouratian N, Starr PA, Foote KD, Okun MS, Wong JK. *Front Hum Neurosci.* 2024 Feb 21;18:1320806. doi: 10.3389/fnhum.2024.1320806

**Striato-pallidal oscillatory connectivity correlates with symptom severity in dystonia patients.** Lofredi R, Feldmann LK, Krause P, Scheller U, Neumann WJ, Krauss JK, Saryyeva A, Schneider GH, Faust K, Sander T, Kühn AA. *Nat Commun.* 2024 Oct 1;15(1):8475. doi: 10.1038/s41467-024-52814-4.

**Motor network gamma oscillations in chronic home recordings predict dyskinesia in Parkinson's disease..** Olaru M, Cernera S, Hahn A, Wozny TA, Anso J, de Hemptinne C, Little S, Neumann WJ, Abbasi-Asl R, Starr PA. *Brain* 2024 Jun 3;147(6):2038-2052. doi: 10.1093/brain/awae004.

**Deep brain stimulation of symptom-specific networks in Parkinson's disease.** Rajamani N, Friedrich H, Butenko K, Dembek T, Lange F, Navrátil P, Zvarova P, Hollunder B, de Bie RMA, Odekerken VJJ, Volkmann J, Xu X, Ling

Z, Yao C, Ritter P, **Neumann WJ**, Skandalakis GP, Komaitis S, Kalyvas A, Koutsarnakis C, Stranjalis G, Barbe M, Milanese V, Fox MD, Kühn AA, Middlebrooks E, Li N, Reich M, Neudorfer C, Horn A. *Nat Commun*. 2024 May 31;15(1):4662. doi: 10.1038/s41467-024-48731-1.

**Generalized sleep decoding with basal ganglia signals in multiple movement disorders.** Yin Z, Yu H, Yuan T, Smyth C, Anjum MF, Zhu G, Ma R, Xu Y, An Q, Gan Y, Merk T, Qin G, Xie H, Zhang N, Wang C, Jiang Y, Meng F, Yang A, **Neumann WJ**, Starr P, Little S, Li L, Zhang J. *NPJ Digit Med*. 2024 May 10;7(1):122. doi: 10.1038/s41746-024-01115-7.

**Rapid Compensation for Noisy Voluntary Movements in Adults with Primary Tic Disorders.** Kurvits L, Stenner MP, Guo S, **Neumann WJ**, Haggard P, Ganos C. *Mov Disord*. 2024 Jun;39(6):955-964. doi: 10.1002/mds.29775.

Oxenford S, Ríos AS, Hollunder B, Neudorfer C, Boutet A, Elias GJB, Germann J, Loh A, Deeb W, Salvato B, Almeida L, Foote KD, Amaral R, Rosenberg PB, Tang-Wai DF, Wolk DA, Burke AD, Sabbagh MN, Salloway S, Chakravarty MM, Smith GS, Lyketsos CG, Okun MS, Anderson WS, Mari Z, Ponce FA, Lozano A, **Neumann WJ**, Al-Fatly B, Horn A. WarpDrive: Improving spatial normalization using manual refinements. *Med Image Anal*. 2024 Jan;91:103041. doi: 10.1016/j.media.2023.103041. Epub 2023 Nov 19. PMID: 38007978.

Yin Z, Jiang Y, Merk T, **Neumann WJ**, Ma R, An Q, Bai Y, Zhao B, Xu Y, Fan H, Zhang Q, Qin G, Zhang N, Ma J, Zhang H, Liu H, Shi L, Yang A, Meng F, Zhu G, Zhang J. Pallidal activities during sleep and sleep decoding in dystonia, Huntington's, and Parkinson's disease. *Neurobiol Dis*. 2023 Jun 15;182:106143. doi: 10.1016/j.nbd.2023.106143. Epub 2023 May 3. PMID: 37146835.

Busch JL, Kaplan J, Habets JGV, Feldmann LK, Roediger J, Köhler RM, Merk T, Faust K, Schneider GH, Bergman H, **Neumann WJ**, Kühn AA. Single threshold adaptive deep brain stimulation in Parkinson's disease depends on parameter selection, movement state and controllability of subthalamic beta activity. *Brain Stimul*. 2024 Jan-Feb;17(1):125-133. doi: 10.1016/j.brs.2024.01.007.

Kunz D, Oster H, Rawashdeh O, **Neumann WJ**, Münte T, Berg D. Sleep and circadian rhythms in  $\alpha$ -synucleinopathies-Perspectives for disease modification. *Acta Physiol (Oxf)*. 2023 May;238(1):e13966. doi: 10.1111/apha.13966. Epub 2023 Apr 7. PMID: 36951649.

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