Curriculum vitae

Lukas Jan Volz, M.D. 04/03/1985 Cologne, Germany German



Education

Name:

Date of birth:

Place of birth: Nationality:

2004 - 2005	Study of Mathematics & Physics at the University of Cologne
2005 - 2011	Study of Medicine at Ruhr-University Bochum (Germany), the University of Stellenbosch (South Africa) and the National University of Singapore (Singapore)
2011	Final medical examination

Research

2008 - 2011	Department for Neurophysiology, Ruhr-University Bochum, Germany (Prof. UT Eysel / Prof. D Manahan-Vaughan) Transcranial magnetic stimulation Group (Prof. K Funke)
2012	Medical dissertation: "Dose-dependence of changes in cortical protein expression induced with repeated transcranial magnetic theta-burst stimulation in the rat"
2012 - 2015	Department of Neurology (Prof. GR Fink), Cologne University Hospital
2012 - 2015	Post-doctoral fellow: Max Planck Institute for neurological Research, Cologne Neuromodulation and Neurorehabilitation Group (<i>Prof. C Grefkes</i>)
2015 - 2017	Post-doctoral fellow: University of California, Santa Barbara, USA UCSB Brain Imaging Center (<i>Prof. ST Grafton</i>)
2015 - 2017	SAGE Junior Research Fellow: SAGE Center for the Study of the Mind, University of California, Santa Barbara, USA (<i>Prof. MS Gazzaniga</i>)
since 10/2017	Department of Neurology (Prof. GR Fink), Cologne University Hospital

Peer-reviewed publications (h-index: 14, i10-index: 18, google scholar):

- Volz LJ, Benali A, Mix A, Neubacher U, Funke K (2013) Dose-dependence of changes in cortical protein expression induced with repeated transcranial magnetic theta-burst stimulation in the rat. *Brain Stimulation* 6(4):598-606
- 2. **Volz LJ**, Grefkes C (2013) Neurophysiological and Neuroimaging Predictors of Functional Recovery after Stroke. *Klinische Neurophysiologie* 44:238-246
- Cárdenas-Morales L*, Volz LJ*, Rehme AK, Pool EM, Nettekoven C, Eickhoff SB, Fink GR, Grefkes C (2014) Network Connectivity and Individual Responses to Brain Stimulation in the Human Motor System. *Cerebral Cortex 24(7):1697-707 (*shared first-authorship)*
- Nettekoven C, Volz LJ, Kutscha M, Pool EM, Rehme AK, Eickhoff SB, Fink GR, Grefkes C (2014) Dosedependent effects of theta-burst rTMS on cortical excitability and resting-state connectivity of the human motor system. *Journal of Neuroscience* 34(20):6849-59
- Volz LJ, Sarfeld AS, Diekhoff S, Rehme AK, Pool EM, Eickhoff SB, Fink GR, Grefkes C (2015) Motor Cortex Excitability and Connectivity in chronic stroke – A multimodal model of functional reorganization. *Brain Structure* and Function 220(2):1093-107
- Rehme AK, Volz LJ, Feis DL, Bomilcar-Focke I, Liebig T, Eickhoff SB, Fink GR, Grefkes C (2015) Identifying neuroimaging markers of motor disability in acute stroke by machine learning techniques. *Cerebral Cortex* 25(9):3046-56
- 7. Volz LJ, Hamada M, Rothwell JC, Grefkes C (2015) What makes the muscle twitch: motor system connectivity and TMS-induced activity. *Cerebral Cortex* 25(9):2346-53
- Michely J, Volz LJ, Barbe M, Hoffstaedter F, Viswanathan S, Timmermann L, Eickhoff SB, Fink GR, Grefkes C (2015) Dopaminergic modulation of motor network dynamics in Parkinson's disease. *Brain 138(Pt 3):664-78*
- Nettekoven C, Volz LJ, Leimbach M, Pool EM, Rehme AK, Eickhoff SB, Fink GR, Grefkes C (2015) Interindividual variability in cortical excitability and motor network connectivity following multiple blocks of rTMS. *NeuroImage 118: 209–218*
- 10. Volz LJ, Eickhoff SB, Pool EM, Fink GR, Grefkes C (2015) Differential Modulation of Motor Network Connectivity during Movements of the Upper and Lower Limbs. *NeuroImage 119: 44–53*
- 11. Rehme AK, **Volz LJ**, Feis DL, Eickhoff SB, Fink GR, Grefkes C (2015) Early neuroimaging predictors of chronic motor disability after stroke. *Human Brain Mapping* 36(11):4553-65
- Krall SC, Volz LJ, Oberwelland E, Grefkes C, Fink GR, Konrad K (2016) The right temporoparietal junction in attention and social interaction: A transcranial magnetic stimulation study. *Human Brain Mapping*, 37(2), 796-807
- 13. Volz LJ, Rehme AK, Michely J, Nettekoven C, Eickhoff SB, Fink GR, Grefkes C (2016) Shaping Early Reorganization of Neural Networks Promotes Motor Function after Stroke. *Cerebral Cortex* 26(6):2882-2894

- 14. Volz LJ, Gazzaniga MS (2017) Interaction in isolation 50 years of insights from split-brain research. *Brain 140* (7): 2051-2060
- 15. Volz LJ, Welborn LB, Gobel MS, Gazzaniga MS, Grafton ST (2017) Harm to self outweighs benefit to others in moral decision making. *Proceedings of the Nation Academy of Sciences 114 (30):* 7963-7968
- Pedrosa DJ, Nelles C, Brown P, Volz LJ, Pelzer EA, Tittgemeyer M, Brittain JS, Timmermann L (2017) The differentiated networks related to Essential tremor onset and its amplitude modulation after alcohol intake. *Experimental Neurology 297: 50–61*
- 17. Volz LJ, Vollmer M, Michely J, Fink GR, Grefkes C, Rothwell JC, Grefkes C (2017) Time-dependent functional role of the contralesional motor cortex after stroke. *NeuroImage: Clinical:* 16: 165-174
- 18. Michely J, **Volz LJ**, Hoffstaedter F, Eickhoff SB, Fink GR, Grefkes C (2018) Network connectivity of motor control in the ageing brain. *NeuroImage: Clinical 18: 443-455*
- 19. Volz LJ, Cieslak M, Grafton ST (2018) Compartmentalizing white matter reduces profound variability of anisotropy measures. *Brain Structure and Function 223(2), 635-651*
- 20. Cohrs G, Huhndorf M, Niemczyk N, **Volz LJ**, Bernsmeier A, Singhal A, Larsen N, Synowitz M, Knerlich-Lukoschus F (2018) MRI in mild pediatric traumatic brain injury: diagnostic overkill or useful tool? *Child's nervous system 34 (7), 1345-1352*
- 21. Volz LJ, Hillyard SA, Miller MB, Gazzaniga MS (2018) Unifying control over the body: consciousness and crosscueing in split-brain patients. *Brain 141 (3), e15*
- 22. Cieslak M, Brennan T, Meiring W, Volz LJ, Asturias A, Surib S, Grafton ST (2018) Analytic tractography: A closed-form solution for estimating local white matter connectivity with diffusion MRI. *NeuroImage 169: 473–484*
- 23. Cieslak M, Meiring W, Brennan T, Greene C, Volz LJ, Vettel JM, Suri S, Grafton ST (2018) Compositional measures of diffusion anisotropy and asymmetry. *Biomedical Imaging (ISBI 2018), IEEE 15th International Symposium: 123-126*
- 24. Volz LJ, Kocher M, Lohmann P, Shah NJ, Fink GR, Galldiks N (2018) Functional magnetic resonance imaging in glioma patients: from clinical applications to future perspectives. *The quarterly journal of nuclear medicine and molecular imaging* 62(3):295-302
- 25. Layher E, Santander T, **Volz LJ**, Miller MB (2018) Failure to affect decision criteria during recognition memory with continuous theta burst stimulation. *Frontiers in Neuroscience 12: 705*
- 26. Greene C, Cieslak M, **Volz LJ**, Hensel L, Grefkes C, Rose K, Grafton ST (2019) Finding maximally disconnected subnetworks with shortest path tractography. *NeuroImage: Clinical: doi.org/10.1016/j.nicl.2019.101903*
- 27. Grafton ST & Volz LJ (2019) From Ideas to Action: The prefrontal-premotor connections that shape motor behavior. In: *The Frontal Lobe (edited by Grafman J & D'Esposito MT). Handbook of Clinical Neurology* 163, 237-255.
- 28. Hensel L, Grefkes C, Tscherpel C, Ringmaier C, Kraus D, Hamacher S, **Volz LJ**, Fink GR. (2019) Intermittent theta burst stimulation applied during early rehabilitation after stroke: study protocol for a randomised controlled trial. *British Medical Journal Open 30;9(12):e034088.*
- 29. Volz LJ, Hamada M, Rothwell JC, Grefkes C (2019) Modulation of I-wave generating pathways by theta-burst stimulation: a model of plasticity induction. *Journal of Physiology* 597(24):5963-5971.

- 30. Tscherpel C, Hensel L, Lemberg K, Freytag J, Michely J, **Volz LJ**, Fink GR, Grefkes C (2020) Age affects the contribution of ipsilateral brain regions to movement kinematics. *Human Brain Mapping* 15;41(3):640-655.
- 31. Hallett M, de Haan W, Deco G, Dengler R, Di Iorio R, Gallea C, Gerloff C, Grefkes C, Helmich R, Kringelbach ML, Mirgalia F, Rektor I, Strycek O, Vecchio F, Volz LJ, Wu T, Rossini PM (2020) Human Brain Connectivity: Clinical Applications for Clinical Neurophysiology. *Clinical Neurophysiology* 131: 1621–1651.
- 32. AK Bonkhoff, FA Espinoza, Harshvardhan G, VM Vergara, L Hensel, Michely J, Paul T, AK Rehme, LJ Volz, GR Fink, VD Calhoun, C Grefkes (2020) Acute ischaemic stroke alters the brain's preference for distinct dynamic connectivity states. *Brain 143(5): 1525–1540.*
- 33. Tscherpel C, Hensel L, Lemberg K, Freytag J, Vollmer M, **Volz LJ**, Fink GR, Grefkes C (2020) The differential roles of contralesional frontoparietal areas in cortical reorganization after stroke. *Brain Stimulation* 13:614-624
- de Haan EHF, Corballis PM, Hillyard SA, Marzi CA, Seth A, Lamme VAF, Volz LJ, Fabri M, Schechter E, Bayne T, Corballis M, Pinto Y (2020) Split-Brain: what we know now and why this is important for understanding consciousness. *Neuropsychology Review doi: 10.1007/s11065-020-09439-3.*

Book chapters:

1. Volz LJ & Grefkes C (2016) Basic Principles of rTMS in Motor Recovery After Stroke. *In: Therapeutic rTMS in Neurology (pp. 23-37). Springer International Publishing.*

Invited Talks (selection):

"Imaging cortical reorganization after stroke", Erwin L. Hahn fMRI Workshop 2013 (09/18/2013 Essen, Germany)

- "Theta burst transcranial magnetic stimulation in subacute stroke: an fMRI study", 20th Annual Meeting of the Organization for Human Brain Mapping 2014 (06/12/2014 Hamburg, Germany)
- "Translational approaches in stroke research", 2. NRW-Forum: Sensorimotor Rehabilitation (07/02/2014 Bochum, Germany)
- "Theta Burst Transkranielle Magnetstimulation bei subakutem Schlaganfall: eine fMRT-Studie", 87th annual meeting of the German society for Neurology 2014 (09/18/2014 Munich, Germany)
- "Repetitive TMS in subacute stroke", 44th Annual Meeting of Japanese Society of Clinical Neurophysiology 2014 (11/19/2014 Fukuoka, Japan)
- "System plasticity and functional recovery: new insights from functional neuroimaging", 5th joined Conference of the German Society for Neurorehabilitation and the German Society for Neurotraumatology and Clinical Neurorehabilitation 2014 (12/5/2014 Singen, Germany)
- "Modulating the lesioned brain a mechanistic approach to the clinical utilization of rTMS in stroke", 59th annual meeting of the German society for clinical neurophysiology and functional imaging 2015 (03/19/2015 Tübingen, Germany)
- "What makes the muscle twitch -The motor network and TMS", *The Cognition and Action Lab, University of California, Berkeley (09/08/2015 Berkeley, USA)*

- "Neuromodulation of the lesioned brain a mechanistic treatment approach for stroke", 88th annual meeting of the German society for Neurology 2015 (09/23/2015 Düsseldorf, Germany)
- "rTMS in Neurorehabilitation What's new?", 60th annual meeting of the German society for clinical neurophysiology and functional imaging 2016 (03/17/2016 Düsseldorf, Germany)
- "Connectivity and neuromodulation of the motor system", 60th annual meeting of the German society for clinical neurophysiology and functional imaging 2016 (03/19/2016 Düsseldorf, Germany)
- "Assessing white matter integrity of the corticospinal tract", University of California, Santa Barbara (09/30/2016, Santa Barbara, USA)
- "Monetary incentives differentially modulate fast and slow motor learning", *Neuroscience 2016 (11/15/2016 San Diego, USA)*
- "Converging perspectives? Evaluation of post-stroke plasticity by TMS and fMRI", UC Davis Center for Mind & Brain (12/02/2016 Davis, USA)
- "Egoistic Altruists approach/avoid decision making in a social context", *Princeton Neuroscience Institute* (01/13/2017 Princeton, USA)
- "Egoistic Altruists approach/avoid decision making in a social context", Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology (01/18/2017 Cambridge, USA)

Reviewing activities for:

Biological Reviews Brain Research Brain Stimulation Brain Structure and Function Cognitive, Affective, and Behavioral Neuroscience Clinical Neurophysiology Clinical Neuroradiology Experimental Brain Research Frontiers Neurology Journal of Cognitive Neuroscience Nature Communications Neural Plasticity NeuroImage NeuroImage: Clinical Neuropsychologia NeuroReport Neuroscience Physiotherapy Theory and Practice Proceedings of the Nation Academy of Sciences

Teaching

2009 – 2010	Practical course: Neurophysiology for medical students (focus: EEG), <i>Ruhr-University Bochum</i>
2012 – 2015 & since 2017	Clinical neurological examination for medical students, University of Cologne
2012	Introduction to neuroscience. Institute for Criminology, University Münster
2013	Introduction to transcranial magnetic stimulation, Master of Neuroscience program, University of Cologne
2014	Transcranial magnetic stimulation of the human motor system, <i>Cologne</i> <i>Summer School and practical course on Neural circuit analysis, Graduate</i> <i>School for Biological Sciences, University of Cologne</i>
2015	Introduction to Transcranial magnetic stimulation, Summer Institute in Cognitive Neuroscience, UCSB, Santa Barbara, USA
2016	Graduate student seminar: "Introduction to cognitive neuroscience" with Prof. M Gazzaniga, UCSB, Santa Barbara, USA
	Graduate student seminar: "Advanced analysis of neuroimaging data", UCSB, Santa Barbara, USA
	"Introduction to Transcranial magnetic stimulation", Summer Institute in Cognitive Neuroscience, UCSB, Santa Barbara, USA
	"Dynamic causal modeling", Summer Institute in Cognitive Neuroscience, UCSB, Santa Barbara, USA
	Workshop on Transcranial Magnetic Stimulation, University of California, Davis, USA
2017	"Introduction to Transcranial magnetic stimulation", Summer Institute in Cognitive Neuroscience, UCSB, Santa Barbara, USA
	"Dynamic causal modeling", Summer Institute in Cognitive Neuroscience, UCSB, Santa Barbara, USA
2018	"Blockpraktikum: Neurologie", University of Cologne

Scholarships

2008 – 2011	Scholar of the German National Academic Foundation ("Studienstiftung des deutschen Volkes")
2013	Travel scholarship for the 19 th Annual Meeting of the Organization for Human Brain Mapping (Seattle, USA) by the German Academic Exchange Service (DAAD)
2014	Travel Award of the Organization for Human Brain Mapping
Personal skills	
Language skills:	German, English, French
Interests:	Sports, especially basketball: German Streetball Champion 2003, participated in the Moscow Open 2008 (Streetball World Championship) for Germany Scuba diving Music (guitar and violin)

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Cologne, June 7th 2020

Lukas J. Volz, M.D.