

Petra Ritter

née Wobst

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CURRENT POSITION

Professor of Brain Simulation (lifetime)
Director, Brain Simulation Section at the Dept. Neurology, Charité Universitätsmedizin Berlin

DEGREES

INSTITUTION AND LOCATION	DEGREE	DATE	FIELD
Educational commission for foreign medical graduates, Philadelphia, USA	United States Medical Exam Step1	12/98	Medicine
Charité University Medicine Berlin, Germany	MD	11/00	Medicine
Charité University Medicine Berlin, Germany	Approbation	07/02	Allowance to practice Medicine
Charité University Medicine Berlin, Germany	Dr.med (doctoral thesis)	11/04	Neuroscience
Charité University Medicine Berlin, Germany	Priv.Do. (habilitation)	01/10	Experimental Neurology
Charité University Medicine Berlin, Germany	Postdoctoral	12/10	Neuroscience

EDUCATION

Medical Intern, Neurology at Harvard Medical School, Boston, USA (Supervisor: Prof. J.D. Schmahmann)	05/2000
Medical Intern, Internal Medicine at Mount Sinai School of Medicine, New York, USA (Supervisor: Prof. A.S. Teirstein)	02/2000 – 04/2000
Medical Intern, General surgery at UCSD Thornton Hospital, La Jolla, USA (Supervisor: Prof. R. Gamagami)	12/1999 – 02/2000
Medical Intern, Neurosurgery & Trauma surgery at UCLA, Los Angeles, USA (Supervisors: Prof. A.I. Feldman & Prof. M.P. Sawicki)	11/1999 – 12/1999
Medical studies, Charité University Medicine Berlin, Germany	10/1994 – 11/2000

POSITIONS

Professor of Brain Simulation (lifetime BIH Johanna Quandt Professor), Dept. Neurology, Charité University Medicine Berlin & Berlin Institute of Health, Germany	10/17 -
Appointment Full Lifetime Professor for Neurophysiology at Padova University, Italy (declined)	09/16
Research Group Leader, Dept. Neurology, Charité University Medicine Berlin, Germany	01/16-09/17
Minerva Research Group Leader (W2 - corresponding to Associate Professor level), MPI Human Cognition and Brain Sciences, Leipzig, Germany	01/11-12/15
Resident Physician in Neurology and Research Fellow, Dept. Neurology, Charité University Medicine Berlin, Germany	01/01-12/10

EXPERIENCE

RESEARCH AND LEADERSHIP EXPERIENCE

Coordinator H2020 Virtual Brain Cloud Consortium (€15Mill)	2018 -
Coordinator, Consortium 'Co-Designing Digital Infrastructure for the Human Brain Project', www.humanbrainproject.eu	2018 -
Steering Committee member Collaborative Research Centre 1315 'Mechanisms and disturbances in memory consolidation', German Research Foundation DFG	2018 -
Steering Committee member Special Priority Program: Computational Connectomics https://spp2041.de/	2017 -
Co-Founder BrainModes App, www.brainmodes.com	2015 -
Co-Lead My Virtual Dream, Integrating Science and Society, www.myvirtualdream.net	2015 -
Co-Founder, The Virtual Brain neuroinformatics platform, www.thevirtualbrain.org	2010 -
Coordinator, National network 'Bernstein Focus: State Dependencies of Learning' (Consortium of five research institutions)	2009 - 2017
Visiting Scientist, Black Dog Institute & UNSW (host: Prof. Breakspear), Randwick, Australia	07/08 – 08/08
Co-Founder, International BrainModes workshop series www.brainmodes.org	2007 -

TEACHING EXPERIENCE

Docent, Interdisciplinary Problem Oriented Learning, Model Curriculum Medicine (undergraduate), Charité Universitätsmedizin Berlin - on average 48 hours per semester.	2003 - 2017
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Supervision of 7 Postdocs, 11 PhD students and 10 Master's students and several lab rotations	2002 -
Organizer, docent, The Virtual Brain Node workshops: Introductions to computational full brain modelling and hands-on sessions (2014: Hamburg, Göttingen, Washington DC; 2015: Berlin, Chicago; 2016: London, Ghent, Hamburg; 2017: Toronto, Marseille; 2018: Berlin, MOntréal)	2014 -
Organizer and presenter, Educational Workshop at FENS Copenhagen, Full Brain Network Dynamics – Modeling, Analyses, Experiments	2016
Organizer and presenter, Educational Workshops at Human Brain Mapping conferences (2014: Workshop Multimodal imaging and electrophysiology; 2015: Workshop Multimodal imaging and electrophysiology & Workshop Modeling)	2014,15
Docent, 2nd International Summer School and Workshop on Brain Dynamics: Connectivity & Cognition. Institute of Theoretical and Applied Physics, ITAP Dereözü Campus, Turunc, Marmaris, Turkey	2013
Educational Talk at Brain Connectivity Workshop, Montreal, Canada	2011
Docent, PhD course Functional Magnetic Resonance Imaging, Copenhagen, Denmark	2009

CLINICAL EXPERIENCE

Basic Qualification Clinical Investigator	2008
Qualification for Clinical Electrophysiology	2006
Clinical Scientist & Neurology Residency at Dept. of Neurology, Charité University Medicine Berlin	2001 - 2007

PROFESSIONAL HONORS AND RECOGNITION

ERC Consolidator Grant	2016
Charité Biomedical Entrepreneurship Summit, Special Award 'Biomedical Business Idea 2009'	2009
Fast Track Scholarship, Robert-Bosch Trust	2007 - 2010
For Women in Science Award, C. Nüsslein-Volhard Trust & UNESCO & L'oreal	2007 - 2009
Rahel-Hirsch Fellowship, Charité Universitätsmedizin Berlin	2006 - 2009
Research Scholarship of the Dean, Charité Universitätsmedizin Berlin	2001 - 2002

GRANT HISTORY

Total acquired funding for own research: ~€10Mill

Total acquired funding as Coordinator for consortia: ~€30Mill

Coordinator, H2020 Research and Innovation Action ‘Virtual Brain Cloud’ €1.965.750 Ritter sub-project / €15,016,343 total	2018-2022
Coordinator, PI, EU-H2020, ‘Human Brain Project: Testing pathophysiological models of brain diseases – The Neurodegenerative Virtual Brain’ € 120,000 (Ritter, sub-project /€ 470,000 total)	2018-2020
Steering Committee, Collaborative Research Centre ‘Mechanisms and disturbances in memory consolidation’, German Research Foundation DFG € 273,600 Ritter, sub-project/ €10,730,100	2018-2022
Coordinator, PI, EU-H2020, ‘Co-Designing Digital Infrastructure for the Human Brain Project: The Virtual Brain’ € 462,250 (Ritter, sub-project /€ 850,000 total)	2018 - 2020
Berlin Institute of Health & Foundation Charité; Role: PI € 2.5 Mill	2017 - 2022
Co-PI, German Research Foundation (DFG), Special Priority Program: Computational Connectomics, Connectome based multi-scale modeling in stroke € 171,950 (Ritter, sub-project)	2018 - 2020
PI, ERC Consolidator Grant, Personalized whole-brain simulations - linking connectomics and dynamics in the human brain € 1.87 Mill	2016 - 2021
Co-PI, German Ministry of Education and Research, US-German Collaboration in Computational Neuroscience Connectomics and large-scale dynamics of the human brain € 270,901.20 (Ritter sub-project)	2016 - 2019
Co-Founder, German Ministry for Economic Affairs and Energy, EXIST Forschungstransfer, Development of a mobile app for commercial brain computer interfaces using The Virtual Brain technology € 500,000	2015 - 2017
Co-PI, JS McDonnell Foundation (USA), Brain Network Recovery Group € 650,000 (Ritter sub-project)	2010 - 2017

Coordinator, PI, German Ministry of Education and Research, Bernstein Focus State Dependencies of Learning, a collaboration between seven research groups from five different institutions in Germany € 440,000 (Ritter, sub-project /€ 2,500,000 total)	2009 – 2016
BrainModes Workshop, German Research Foundation (DFG) € 10,500	2010
Brain Connectivity Workshop, German Research Foundation (DFG) € 23,230	2010
Coordinator, PI, German-Australian Collaboration, German Ministry of Education and Research € 7,000	2008 - 2009
Rahel Hirsch Scholarship Charité University Medicine, Berlin € 190,000	2006 - 2009

ACADEMIC SERVICE, FUNCTIONS, MEMBERSHIPS

Scientific Advisory Board of the Rector's Board, Universität Bonn	2018 -
European Research Council (ERC) panel member and deputy panel chair (since 2016)	2011 - 2018
Advisory Board member, Fraunhofer Institute for Algorithms and Scientific Computing SCAI, https://www.scai.fraunhofer.de/	2018 -
Editorial Board Member Network Neuroscience Journal	2016 -
Editorial Board, Brain Connectivity Journal	2011 -
Editorial Board, NeuroImage	2011 – 2014
Member, Brain Connectivity Workshop Advisory Board, www.brain-connectivity-workshop.org	2010 -
Member, Project Committee, Bernstein Computational Neuroscience Network	2009 -
Member, Society for Neuroscience (SfN)	1999 -
Member, Organization Human Brain Mapping (OHBM)	1998 -

PUBLICATIONS

h-index (Google Scholar): 28

PEER-REVIEWED JOURNALS

1. Schirner, McIntosh, Jirsa, Deco, Ritter (2018) Inferring multi-scale neural mechanisms with brain network modelling. eLife IF-2016: 7.725
2. Aerts, Schirner, Jeurissen, Van Roost, Achten, Ritter, Marinazzo (2018) Modeling brain dynamics in brain tumor patients using The Virtual Brain. eNeuro

3. Zimmermann, Perry, Breakspear, Schirner, Sachdev, Wen, Kochan, Mapstone, Ritter, McIntosh, Solodkin (2018) Differentiation of Alzheimer's disease based on local and global parameters in personalized Virtual Brain models. *Neuroimage Clinical* (in press) IF-2016: 4.348
4. Zimmermann, Griffiths, Schirner, Ritter, McIntosh (2018) Subject-specificity of the correlation between large-scale structural and functional connectivity. *Network Neuroscience*
5. Glomb, Ponce-Alvarez, Gilson, Ritter, Deco (2017) Stereotypical modulations in dynamic functional connectivity explained by changes in BOLD variance. *Neuroimage* IF-2016: 5.835
6. Deco, Kringelbach, Jirsa, Ritter (2017) The dynamics of resting fluctuations in the brain: metastability and its dynamical core. *Scientific Reports* IF-2015: 5.228
7. Glomb, Ponce-Alvarez, Gilson, Ritter, Deco (2017) Resting State Networks in empirical and simulated dynamic functional connectivity. *Neuroimage* IF-2016: 5.835
8. Hay, Ritter, Lobaugh, McIntosh (2017) Multiregional Integration in the Brain during Resting-state fMRI Activity. *Plos Computational Biology* IF-2015: 4.587
9. Bezgin, Solodkin, Bakker, Ritter, McIntosh (2017) Mapping complementary features of cross-species structural connectivity to construct realistic "Virtual Brains" *Human Brain Mapping* IF-2014: 5.969
10. Proix, Spiegler, Schirner, Rothmeier, Ritter, Jirsa (2016) How do parcellation size and short-range connectivity affect dynamics in large-scale brain network models? *Neuroimage* IF-2014: 6.35
11. Stefanovsky, Ghani, McIntosh, Ritter (2016) Linking connectomics and dynamics in the human brain: Big data need big theories! *Neuroforum*. journal has no impact factor
12. Saggio ML, Ritter P, Jirsa V (2016) Analytical Operations Relate Structural and Functional Connectivity in the Brain. *Plos One* IF-2014: 3.234
13. Demirtas, Tornador, Falcon, Lopez-Sola, Hernandez-Ribas, Pujol, Menchon, Ritter, Cardoner, Soriano-Mas, Deco (2016) Dynamic functional connectivity reveals altered variability in functional connectivity among patients with major depressive disorder. *Human Brain Mapping* 37(8):2918-30 IF-2014: 5.969
14. Zimmermann, Ritter, Shen, Rothmeier, Schirner, McIntosh (2016) Structural Architecture Supports Functional Organization in the Human Aging Brain at a Region-wise and Network Level. *Human Brain Mapping* IF-2014: 5.969
15. Gilson, Moreno-Bote, Ponce-Alvarez, Ritter, Deco (2016) Estimation of Directed Effective Connectivity from fMRI Functional Connectivity Hints at Asymmetries in Cortical Connectome. *PLoS Computational Biology* IF-2014: 4.62
16. Kringelbach, McIntosh, Ritter, Jirsa, Deco (2015) The rediscovery of slowness: exploring the timing of cognition. *Trends in Cognitive Science* 19(10):616-28 IF-2014: 21.965
17. Schirner, M., S. Rothmeier, V. Jirsa, A. R. McIntosh and Ritter, P. (2015). An automated pipeline for constructing personalised virtual brains from multimodal neuroimaging data. *Neuroimage*. IF-2014: 6.357
18. Becker, R., S. Knock, P. Ritter*, V. Jirsa* (2015). Relating alpha power and phase to population firing and hemodynamic activity using a thalamo-cortical neural mass model *PLoS Computational Biology*. *Shared Senior Authorship IF-2014: 4.62
19. Ritter, P., J. Born, M. Brecht, H. R. Dinse, U. Heinemann, B. Pleger, D. Schmitz, S. Schreiber, A. Villringer and R. Kempter (2015). "State-dependencies of learning across brain scales." *Front Comput Neurosci* 9. IF-2014: 2.201
20. Matzke H, Schirner M, Vollbrecht D, Rothmeier S, Llarena A, Rojas R, Domide L, Mersmann J, Solodkin A, Jirsa V, McIntosh AR, Ritter P (2015). TVB-EduPack - An interactive learning and scripting platform for The Virtual Brain. *Frontiers Neuroinformatics* IF-2014: 3.262
21. Ritter P, Jirsa VK, McIntosh AR, Breakspear M. Editorial: State-dependent brain computation. *Front Comput Neurosci*. 2015 Jan 9;77. IF-2014: 2.201

22. Kovacevic, N., P. Ritter, et al. (2015). "My Virtual Dream': a new avenue for Neuroscience study of collective neurofeedback in an immersive art environment " Plos ONE. IF-2014: 3.234
23. Roy, D., R. Sigala, M. Breakspear, A. R. McIntosh, V. K. Jirsa, G. Deco and P. Ritter (2014). "Using the Virtual Brain to Reveal the Role of Oscillations and Plasticity in Shaping Brain's Dynamical Landscape." *Brain Connect* 4(10),791-811 (IF-2014: 6.24)
24. Sigala, R., S. Haufe, D. Roy, H. R. Dinse and P. Ritter (2014). "The role of alpha-rhythm states in perceptual learning: insights from experiments and computational models." *Front Comput Neurosci* 8: 36. IF-2014: 2.201
25. Freyer, F., Becker, R., Dinse, H., Ritter, P. (2013). State-dependent perceptual learning. *J. Neuroscience* 33(7):2900-7. IF-2011: 7.115
26. Ritter, P., M. Schirner, A. R. McIntosh and V. K. Jirsa (2013). "The virtual brain integrates computational modeling and multimodal neuroimaging." *Brain Connect* 3(2): 121-145. (IF-2013: 7.57)
27. Freyer, F., Roberts, J. A., Ritter, P., & Breakspear, M. (2012). A canonical model of multistability and scale-invariance in biological systems. *PLoS Computational Biology*, 8(8) IF-2011: 5.215
28. Freyer F, Reinacher M, Nolte G, Dinse HR, Ritter P (2012) Short-term repetitive sensory stimulation leads to changes in alpha-band resting-state functional connectivity – implications for treatment of sensorimotor decline. *Frontiers in Human Neuroscience* 6:144 IF-2015: 3.626
29. Becker R, Reinacher M, Freyer F, Villringer A, Ritter P. (2011) How ongoing neuronal oscillations account for variability of evoked fMRI responses *J. Neuroscience* 31(30):11016-27 IF-2011: 7.115
30. Freyer F, Roberts JA, Becker R, Robinson P, Ritter P, Breakspear M (2011) Biophysical mechanisms of multistability in resting-state cortical rhythms. *J. Neuroscience* 31(17):6353-61 IF-2011: 7.115
31. Schultze-Kraft M, Becker R, Breakspear M, Ritter P, (2010) Exploiting the potential of three dimensional spatial wavelet analysis to explore the nesting of oscillations and spatial variance in simultaneous EEG-fMRI data. *Progress in Biophysics and Molecular Biology*. 105(1-2):67-79 IF-2010: 3.964
32. Terry, JR, Ritter P, Daffertshofer A, (2010) *Progress in Biophysics and Molecular Biology*. Editorial. *BrainModes: The role of neuronal oscillations in health and disease*. 105(1-2):1-4 IF-2009: 3.992
33. Freyer F, Aquino K, Robinson P, Ritter P, Breakspear M. (2009) Non-Gaussian statistics in temporal fluctuations of spontaneous cortical activity. *J. Neuroscience* 29(26): 8512-24 IF-2009: 7.178
34. Reinacher M, Becker R, Villringer A, Ritter P. (2009) Oscillatory brain states interact with late cognitive components of the somatosensory evoked potential. *J Neurosci Methods* 183(1):49-56 IF-2009: 2.295
35. Freyer, Becker, Anami, Curio, Villringer, Ritter (2009) Ultrahigh-frequency EEG during fMRI: Pushing the limits of imaging-artifact correction. *Neuroimage* 48(1):94-108 IF-2009: 5.739
36. Ritter P, Moosmann M, Villringer A. (2009) Rolandic Alpha and Beta EEG Rhythms' Strengths are Inversely Related to fMRI-BOLD Signal in Primary Somatosensory and Motor Cortex. *Human Brain Mapping* 30(4):1168-87 IF-2009: 6.256
37. Ritter P & Becker R, (2009) Detecting Alpha Rhythm Phase Reset by Phase Sorting: Caveats to Consider, *Neuroimage* 47(1):1-4 IF-2009: 5.739
38. Nierhaus T, Schön T, Becker R, Ritter P, Villringer A. (2009) Background and Evoked Activity and its Interaction in the Human Brain. *Journal of Magnetic Resonance Imaging*. 27(8):1140-50 IF-2009: 2.026
39. Breakspear M., Daffertshofer A, Ritter P, (2009) Editorial. *Brain Modes: A principled approach to modelling and measuring large-scale neuronal activity*. *J. Neurosci Methods*.183(1):1-4 IF-2009: 2.295
40. Ritter P, Freyer F, Curio G, Villringer A. (2008) High-frequency (600 Hz) population spikes in human EEG delineate thalamic and cortical activation sites. *Neuroimage* 42(2):483-90. IF-2008: 7.168

41. Schubert R, Ritter P, Wüstenberg T, Preuschhof C, Curio G, Sommer W, Villringer A. (2008) Simultaneous EEG-fMRI reveals correlation of SEPs with BOLD signal in S1 during spatial attention. *Cerebral Cortex*. IF-2008: 5.907
42. Becker R, Ritter P*, Villringer A* (2008) Influence of Ongoing Alpha Rhythm on the Visual Evoked Potential. *Neuroimage*. 39(2):707-16 *shared senior authorship IF-2008: 5.694
43. Ritter P, Becker R, Graefe C, Villringer A (2007) Evaluating gradient artefact correction of EEG data acquired simultaneously with fMRI, *Journal of Magnetic Resonance Imaging* 25(6):923-32 IF-2007: 1.486
44. Ritter P, Villringer A (2006) Simultaneous EEG-fMRI, *Neuroscience Biobehav R* 30(6):823-38 IF-2006: 8.293
45. Becker, Ritter, Moosmann, Villringer (2005) Recording of visual evoked potentials during functional magnetic resonance acquisition periods. *Human Brain Mapping* 26(3):221-30 IF-2005 4.317
46. Moosmann M*, Ritter P*, Krastel I, Brink A, Thees S, Blankenburg F, Taskin B, Obrig H, Villringer A (2003) Correlates of alpha rhythm in functional magnetic resonance imaging and near infrared spectroscopy. *Neuroimage* 20: 145-158 *shared first authorship IF-2003 6.192
47. Blankenburg F, Taskin B, Ruben J, Moosmann M, Ritter P, Curio G, Villringer A (2003) Imperceptible stimuli and sensory processing impediment. *Science* 299: 1864 IF-2003 29.781
48. Wobst P (Ritter P), Wenzel R, Kohl M, Obrig H, Villringer A (2001) Linear Aspects of Changes in Deoxygenated Hemoglobin Concentration and Cytochrome Oxidase Oxidation during Brain Activation. *Neuroimage* 2001 Mar ;13 (3):520 -530 13: 520-530 IF-2001 7.879
49. Wenzel R, Wobst P (Ritter P), Heekeren HH, Kwong KK, Brandt SA, Kohl M, Obrig H, Dirnagl U, Villringer A (2000) Saccadic suppression induces focal hypooxygenation in the occipital cortex. *J Cereb Blood Flow Metab* 7: 1103-1110 IF-2000 5.926
50. Obrig H, Wenzel R, Kohl M, Horst S, Wobst P (Ritter P), Steinbrink J, Thomas F, Villringer A (2000) Near-infrared spectroscopy: does it function in functional activation studies of the adult brain? *Int J Psychophysiol* 35: 125-142 IF-2000: 1.409

ONLINE - CURRENTLY UNDER PEER REVIEW

1. Battaglia, Boudou, Hansen, Chettouf, Daffertshofer, McIntosh, Zimmermann, Ritter, Jirsa (2017) Functional Connectivity Dynamics of the Resting State across the Human Adult Lifespan bioRxiv doi: <http://dx.doi.org/10.1101/107243>

BOOKS AND BOOK CHAPTERS

1. Solodkin, Zimmermann, McIntosh, Stefanovski, Ritter (2017) Neurological biomarkers and Neuroinformatics: The role of The Virtual Brain. Book: in *Molecular-Genetic and Statistical Techniques for Behavioral and Neural Research*
2. Ritter P, Becker R, Freyer F, Villringer A (2010) Imaging Artefact. In C Mulert and L Lemieux, eds *EEG-fMRI Physiology, Technique and Application*. Springer
3. Becker R, Ritter P, Villringer A (2010) Visual System. In C Mulert and L Lemieux, eds *EEG-fMRI Physiology, Technique and Application*. Springer
4. Ritter P, Freyer F, Gärtner M, Villringer A (2008) Bildhafte Wissenspräsentation – Funktionelle Bildgebung mit simultaner EEG-fMRT. In Horst Bredekamp, Matthias Bruhn eds. *Bildwelten des Wissens, 6.1: Ikonographie des Gehirns*
5. Ritter P (2004) Neurovasikuläre und neurometabolische Kopplung bei kortikaler Aktivierung und Deaktivierung (Dissertation), Logos Verlag
6. Ritter P, Villringer A (2002) Inhibition and functional magnetic resonance imaging. In M Tomita, I Kanno, E Hamel, eds *Brain Activation and CBF Control*, Ed. first. Elsevier, pp 213-222

PATENTS

McIntosh AR, Mersmann J, Jirsa VK, Ritter P. Method and Computing System for Modeling a Primate Brain. Patent Application 137PCT1754 (decision pending).