

DAVID BERRON

RESEARCH GROUP LEADER

Clinical Cognitive Neuroscience Group, German Center for Neurodegenerative Diseases, Magdeburg, Germany

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RESEARCH OVERVIEW

The research of my group focuses on three major aims. First, we conduct studies to understand the functional architecture of cognitive functions with a special focus on human memory and the medial temporal lobe using structural and functional MRI at 3 and 7 Tesla. Second, we investigate the effects of disease pathology, such as amyloid plaques and neurofibrillary tangles measured using biomarkers, on functional brain systems and use longitudinal experimental designs and advanced statistical models to understand the sequence of changes in early stages of neurodegenerative diseases. Finally, we aim to develop disease-stage specific imaging and cognitive markers that allow to detect cognitive impairment but also to monitor cognitive and brain decline. Here we focus particularly on digital cognitive markers using remote testing via mobile devices such as smartphones and tablet computers and their combination with novel biomarkers for future health care and clinical trial applications.

ACADEMIC EXPERIENCE

German Center for Neurodegenerative Diseases (DZNE)

PI AND GROUP LEADER

Magdeburg, Germany
2021 - present

Lund University

POSTDOCTORAL RESEARCHER (MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIP)

Lund, Sweden
2018 - 2021

Otto-von-Guericke University

POSTDOCTORAL RESEARCHER

Magdeburg, Germany
2017 - 2018

EDUCATION

Otto-von-Guericke University

PHD IN COGNITIVE NEUROSCIENCE

- Thesis title: Functional architecture of medial temporal lobe pathways and mnemonic discrimination in young and elderly adults

Magdeburg, Germany
2012 - 2017

Massachusetts Institute of Technology

VISITING RESEARCHER

Cambridge (MA), US
2010 - 2010

University of Bremen

DIPLOMA IN PSYCHOLOGY (EQUIVALENT TO MSc DEGREE)

Bremen, Germany
2006 - 2011

AWARDS AND SCHOLARSHIPS

European Union's Horizon 2020 research and innovation programme

MARIE SKŁODOWSKA-CURIE POSTDOCTORAL FELLOW

2019 - 2021

Four conference travel awards

HUMAN AMYLOID IMAGING CONFERENCE, MULTI PARK, ALZHEIMER FORSCHUNG INITIATIVE, GSK FOUNDATION

2017 - 2020

Excellence doctoral scholarship

GERMAN NATIONAL ACADEMIC FOUNDATION

2012 - 2015

Award for research visit at Massachusetts Institute of Technology

FELGENHAUER FOUNDATION OF THE GERMAN NEUROLOGICAL SOCIETY (DGN)

2010 - 2010

Excellence student scholarship

GERMAN NATIONAL ACADEMIC FOUNDATION

2009 - 2012

LEADERSHIP POSITIONS AND INTERNATIONAL WORKING GROUPS

Hippocampal Subfields Group (HSG)

MEMBER OF THE STEERING COMMITTEE

www.hippocampalsubfields.com

European Ultrahigh-field Imaging Network for Neurodegenerative Diseases (EUFIND)

ACTIVE WORKING GROUP MEMBER

www.eufind.org

Norwegian National Anti-Alzheimer's Disease Network (NO-AD)

HONORARY INTERNATIONAL MEMBER

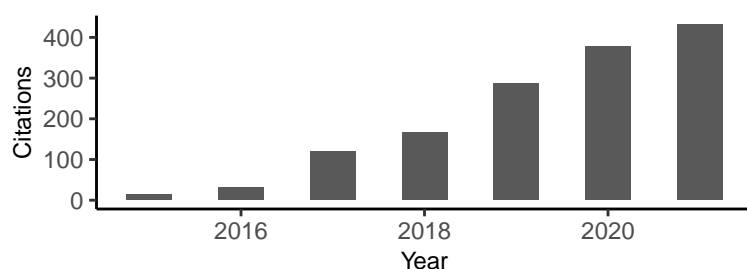
www.noad100.com

OTHER ACADEMIC EXPERIENCE

Teaching	e.g manual segmentation workshops and lectures in Advanced Neuroscience program at Lund University e.g Nature Communications, Brain, eLife, Current Biology, Journal of Neuroscience, NeuroImage, Neuroimage: Clinical,
Ad Hoc Reviewer	Neurobiology of Ageing, Cortex and grant agencies such as L'Agence nationale de la recherche (ANR). See my [publons profile](https://publons.com/researcher/1265906/david-berron/peer-review/) for a detailed list.
Symposia organization	e.g Neuro.Wissen.Schaffen PhD conference and hippocampal subfield working group meetings
Supervision	F. Samatin (B.Sc.), S. Schetat (M.Sc.), D. Groß (MD), J. Güsten (PhD), X. Grande (PhD), F. Öhman (PhD)

PUBLICATIONS

Summary In sum, I have published **33** research papers including **10** first/last- and **23** co-authorships. My papers have been cited **1451** times (H index: 18, Google Scholar, 23.07.2021). *indicates equal contribution.



Adams, J. N., Maass, A., Berron, D., Libby, T. M., Harrison, Baker, S., Thomas, W., Stanfill, M., & Jagust, W. J. (2021). Reduced repetition suppression in aging is driven by tau-related hyperactivity in medial temporal lobe. *Journal of Neuroscience*.

Berron, D., Vogel, J., Insel, P., Pereira, J., Xie, L., Wisse, L., Yushkevich, P., Palmqvist, S., Mattsson, N., Stomrud, E., Smith, R., Strandberg, O., & Hansson, O. (2021). Early stages of tau pathology and its associations with functional connectivity, atrophy and memory. *Brain*. <https://doi.org/10.1093/brain/awab114>

Grande, X., Berron, D., Maass, Anne, Bainbridge, W., & Düzel, E. (2021). Content-specific vulnerability of recent episodic memories in Alzheimer's disease. *Neuropsychologia*.

Güsten, J., Ziegler, G., Düzel, E., & Berron, D. (2021). Age impairs mnemonic discrimination of objects more than scenes: a web-based, large scale approach across the lifespan. *Cortex*.

Janelidze, S., Berron, D., Smith, R., Strandberg, O., Proctor, N. K., Dage, J. L., Stomrud, E., Palmqvist, S., Mattsson-Carlgren, N., & Hansson, O. (2021). Associations of Plasma Phospho-Tau217 Levels With Tau Positron Emission Tomography in Early Alzheimer Disease. *JAMA Neurology*.

Öhman, F., Hassenstab, J., Berron, D., Schöll, M., & Papp, K. V. (2021). Current advances in digital cognitive assessment for preclinical Alzheimer's disease. *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring*.

Berron, D., Westen, D. van, Ossenkoppele, R., Strandberg, O., & Hansson, O. (2020). Medial temporal lobe connectivity and its associations with cognition in early Alzheimer's disease. *Brain: A Journal of Neurology*.

Insel, P. S., Donohue, M. C., Berron, D., Hansson, O., & Mattsson-Carlgren, N. (2020). Time between milestone events in the Alzheimer's disease amyloid cascade. *NeuroImage*.

Nyberg, L., Grande, X., Andersson, M., Berron, D., Lundquist, A., Stiernstedt, M., Fjell, A., Walhovd, K., & Orädd, G. (2020). Forecasting memory function in aging: pattern-completion ability and hippocampal activity relate to visuospatial functioning over 25 years. *Neurobiology of Aging*.

Wisse, L. E. M., Chételat, G., Daugherty, A. M., Flores, R., Joie, R., Mueller, S. G., Stark, C. E. L., Wang, L., Yushkevich, P. A., Berron, D., Raz, N., Bakker, A., Olsen, R. K., & Carr, V. A. (2020). Hippocampal subfield volumetry from structural isotropic 1 mm³ MRI scans: A note of caution. *Human Brain Mapping*.

Young, P. N. E., Estarellas, M., Coomans, E., Srikrishna, M., Beaumont, H., Maass, A., Venkataraman, A. V., Lissaman, R., Jiménez, D., Betts, M. J., McGlinchey, E., Berron, D., O'Connor, A., Fox, N. C., Pereira, J. B., Jagust, W., Carter, S. F., Paterson, R. W., & Schöll, M. (2020). Imaging biomarkers in neurodegeneration: current and future practices. *Alzheimer's Research & Therapy*.

Bainbridge, W. A., Berron, D., Schütze, H., Cardenas-Blanco, A., Metzger, C., Dobisch, L., Bittner, D., Glanz, W., Spottke, A., Rudolph, J., Brosseron, F., Buerger, K., Janowitz, D., Fliessbach, K., Heneka, M., Laske, C., Buchmann, M., Peters, O., Diesing, D., ... Düzel, E. (2019). Memorability of photographs in subjective cognitive decline and mild cognitive impairment: Implications for cognitive assessment. *Alzheimer's & Dementia (Amsterdam, Netherlands)*.

Berron, D., Cardenas-Blanco, A., Bittner, D., Metzger, C. D., Spottke, A., Heneka, M. T., Fließbach, K., Schneider, A., Teipel, S. J., Wagner, M., Speck, O., Jessen, F., & Düzel, E. (2019). Higher CSF tau levels are related to hippocampal hyperactivity and object mnemonic discrimination in older adults. *The Journal of Neuroscience: The Official Journal of the Society for Neuroscience*.

Düzel, E., Acosta-Cabrero, J., Berron, D., Biessels, G. J., Björkman-Burtscher, I., Bottlaender, M., Bowtell, R., Buchem, M. V., Cardenas-Blanco, A., Boumezbeur, F., Chan, D., Clare, S., Costagli, M., Rochefort, L. de, Fillmer, A., Gowland, P., Hansson, O., Hendrikse, J., Kraff, O., ... Speck, O. (2019). European Ultrahigh-Field Imaging Network for Neurodegenerative Diseases (EUFIND). *Alzheimer's & Dementia (Amsterdam, Netherlands)*.

Flores*, R., Berron*, D., Ding, S., Ittyerah, R., Pluta, J. B., Xie, L., Adler, D. H., Robinson, J. L., Schuck, T., Trojanowski, J. Q., Grossman, M., Liu, W., Pickup, S., Das, S. R., Wolk, D. A., Yushkevich, P. A., & Wisse, L. E. M. (2019). Characterization of hippocampal subfields using ex vivo MRI and histology data: Lessons for in vivo segmentation. *Hippocampus*.

Grande, X., Berron, D., Horner, A. J., Bisby, J. A., Düzel, E., & Burgess, N. (2019). Holistic recollection via pattern completion involves hippocampal subfield CA3. *The Journal of Neuroscience: The Official Journal of the Society for Neuroscience*.

Maass, A., Berron, D., Harrison, T. M., Adams, J. N., Joie, R. L., Baker, S., Mellinger, T., Bell, R. K., Swinnerton, K., Inglis, B., Rabinovici, G. D., Düzel, E., & Jagust, W. J. (2019). Alzheimer's pathology targets distinct memory networks in the ageing brain. *Brain: A Journal of Neurology*.

Olsen, R. K., Carr, V. A., Daugherty, A. M., Joie, R. L., Amaral, R. S. C. S., Amunts, K., Augustinack, J. C., Bakker, A., Bender, A. R., Berron, D., Boccardi, M., Bocchetta, M., Burggren, A. C., Chakravarty, M. M., Chételat, G., Flores, R. de, DeKraaker, J., Ding, S.-L. L., Geerlings, M. I., ... Group, H. S. (2019). Progress update from the hippocampal subfields group. *Alzheimer's & Dementia (Amsterdam, Netherlands)*.

Smith, R., Santillo, A., Landqvist Waldö, M., Strandberg, O., Berron, D., Vestberg, S., Westen, D. van, Swieten, J. van, Honer, M., & Hansson, O. (2019). 18F-Flortaucipir in TDP-43 associated frontotemporal dementia. *Scientific Reports*.

Spallazzi, M., Dobisch, L., Becke, A., Berron, D., Stucht, D., Oeltze-Jafra, S., Caffarra, P., Speck, O., & Düzel, E. (2019). Hippocampal vascularization patterns: A high-resolution 7 Tesla time-of-flight magnetic resonance angiography study. *NeuroImage. Clinical*.

Vieweg, P., Riemer, M., Berron, D., & Wolbers, T. (2019). Memory Image Completion: Establishing a task to behaviorally assess pattern completion in humans. *Hippocampus*.

Berron, D., Neumann, K., Maass, A., Schütze, H., Fliessbach, K., Kiven, V., Jessen, F., Sauvage, M., Kumaran, D., & Düzel, E. (2018). Age-related functional changes in domain-specific medial temporal lobe pathways. *Neurobiology of Aging*.

Düzel, E., Berron, D., Schütze, H., Cardenas-Blanco, A., Metzger, C., Betts, M., Ziegler, G., Chen, Y., Dobisch, L., Bittner, D., Glanz, W., Reuter, M., Spottke, A., Rudolph, J., Brosseron, F., Buerger, K., Janowitz, D., Fliessbach, K., Heneka, M., ... Jessen, F. (2018). CSF total tau levels are associated with hippocampal novelty irrespective of hippocampal volume. *Alzheimer's & Dementia (Amsterdam, Netherlands)*.

Koster, R., Chadwick, M. J., Chen, Y., Berron, D., Banino, A., Düzel, E., Hassabis, D., & Kumaran, D. (2018). Big-Loop Recurrence within the Hippocampal System Supports Integration of Information across Episodes. *Neuron*.

Berron*, D., Vieweg*, P., Hochkeppeler, A., Pluta, J. B., Ding, S.-L. L., Maass, A., Luther, A., Xie, L., Das, S. R., Wolk, D. A., Wolbers, T., Yushkevich, P. A., Düzel, E., & Wisse, L. E. M. E. (2017). A protocol for manual segmentation of medial temporal lobe subregions in 7 Tesla MRI. *NeuroImage. Clinical*.

Berron, D., Schütze, H., Maass, A., Cardenas-Blanco, A., Kuijff, H. J., Kumaran, D., & Düzel, E. (2016). Strong Evidence for Pattern Separation in Human Dentate Gyrus. *The Journal of Neuroscience*.

Loh, E., Kumaran, D., Koster, R., Berron, D., Dolan, R., & Düzel, E. (2016). Context-specific activation of hippocampus and SN/VTA by reward is related to enhanced long-term memory for embedded objects. *Neurobiology of Learning and Memory*.

Loh, E., Kurth-Nelson, Z., Berron, D., Dayan, P., Düzel, E., Dolan, R., & Guitart-Masip, M. (2016). Parsing the Role of the Hippocampus in Approach–Avoidance Conflict. *Cerebral Cortex*.

Moon, H., Becke, A., Berron, D., Becker, B., Sah, N., Benoni, G., Janke, E., Lubejko, S. T., Greig, N. H., Mattison, J. A., Düzel, E., & Praag, H. van. (2016). Running-Induced Systemic Cathepsin B Secretion Is Associated with Memory Function. *Cell Metabolism*.

Wisse, L. E., Daugherty, A. M., Olsen, R. K., Berron, D., Carr, V. A., Stark, C. E., Amaral, R. S., Amunts, K., Augustinack, J. C., Bender, A. R., Bernstein, J. D., Boccardi, M., Bocchetta, M., Burggren, A., Chakravarty, M., Chupin, M., Ekstrom, A., Flores, R. de, Insausti, R., ... Group, H. (2016). A harmonized segmentation protocol for hippocampal and parahippocampal subregions: Why do we need one and what are the key goals? *Hippocampus*.

Berron, D., Frühholz, S., & Herrmann, M. (2015). Neural Control of Enhanced Filtering Demands in a Combined Flanker and Garner Conflict Task. *PLOS ONE*.

Maass*, A., Berron*, D., Libby, L. A., Ranganath, C., & Düzel, E. (2015). Functional subregions of the human entorhinal cortex. *eLife*.

Maass, A., Schütze, H., Speck, O., Yonelinas, A., Tempelmann, C., Heinze, H.-J., Berron, D., Cardenas-Blanco, A., Brodersen, K. H., Stephan, K., & Düzel, E. (2014). Laminar activity in the hippocampus and entorhinal cortex related to novelty and episodic encoding. *Nature Communications*.

BOOK CHAPTERS AND INVITED ARTICLES

Berron, D., & Düzel, E. (2019). Digitales Monitoring von spezifischen kognitiven Beeinträchtigungen in der frühen Alzheimer-Erkrankung. In Jessen, F., Bug, C. (Hrsg.): "Disease Interception," eRelation Verlag, Bonn, S. 79-91.

Düzel, E., Thyrian, J. R., & Berron, D. (2019). Innovation in der Diagnostik – Mobile Technologien. *Der Nervenarzt*.

THESES

Berron D. 2017. Functional Architecture of Medial Temporal Lobe Pathways and Mnemonic Discrimination in Young and Elderly Adults. PhD thesis. Otto-von-Guericke University Magdeburg. Germany.

Berron D. 2011. Neuronal mechanisms underlying Garner and Flanker interference processing – Insights from neuroimaging. Diploma thesis. University of Bremen. Germany.

SELECTED INVITED TALKS

University of Liège (invited by Christine Bastin)

BRAIN AND MEMORY DYSFUNCTION IN EARLY STAGES OF ALZHEIMER'S DISEASE: FROM NEUROIMAGING TO DIGITAL BIOMARKERS

Liège, Belgium
2021

Wallenberg Centre for Molecular and Translational Medicine (invited by Michael Schöll)

FUNCTIONAL ARCHITECTURE AND INTEGRITY OF MTL MEMORY PATHWAYS IN AGEING AND EARLY ALZHEIMER'S DISEASE

Gothenburg University, Sweden
2017

Helen Wills Neuroscience Institute (invited by Bill Jagust)

STRUCTURAL AND FUNCTIONAL INTEGRITY OF MTL PATHWAYS IN AGEING AND EARLY ALZHEIMER'S DISEASE

UC Berkeley, US
2016

Medical Research Council, Cognition and Brain Sciences Unit (invited by Rik Henson)

DOMAIN-SPECIFIC PRECISION OF RECOGNITION MEMORY IN THE HUMAN MEDIAL TEMPORAL LOBE

Cambridge, UK
2015

SELECTED CONFERENCE TALKS

AD/PD (virtual meeting)

REMOTE MOBILE-APP-BASED MEMORY ASSESSMENTS REFLECT TRADITIONAL MEMORY MEASURES AND ARE SENSITIVE TO

MEASURES OF TAU PATHOLOGY

Barcelona, Spain

2021

Clinical Trials in Alzheimer's Disease (CTAD, virtual meeting)

REMOTE MOBILE-APP-BASED MEMORY ASSESSMENTS REFLECT TRADITIONAL MEMORY MEASURES AND ARE SENSITIVE TO

MEASURES OF TAU PATHOLOGY

Boston, US

2020

Alzheimer's Association International Conference (virtual meeting)

TAU, NEURAL FUNCTION AND EPISODIC MEMORY IN THE MEDIAL TEMPORAL LOBE

Amsterdam, NLD

2020

AAT-AD/PD (virtual meeting)

MEDIAL TEMPORAL LOBE FUNCTIONAL CONNECTIVITY ALTERATIONS DURING THE EARLY STAGES OF ALZHEIMER'S DISEASE

Vienna, AUT

2020

Human Amyloid Imaging meeting

AREA 35 IS THE FIRST MTL SUBREGION AFFECTED BY TAU PATHOLOGY

Miami, US

2020

Alzheimer's Association International Conference

ORGANIZATION OF A FEATURED RESEARCH SYMPOSIUM "EFFECTS OF AD PATHOLOGY ON FUNCTIONAL BRAIN SYSTEMS"

Chicago, US

2018

Dementia MRI conference

OBJECT AND SCENE MEMORY ARE DIFFERENTIALLY ASSOCIATED WITH CSF MARKERS OF AD AND MRI VOLUMETRY.

Cardiff, Wales

2017

