

CURRICULUM VITAE

Matthew Budde PhD

Associate Professor
Department of Neurosurgery
Division of Research

OFFICE ADDRESS:

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EDUCATION:

12/2001 B.S. Psychology, University of Wisconsin, Madison, WI
05/2008 Ph.D. Neuroscience, Washington University, St Louis, MO

POSTGRADUATE TRAINING AND FELLOWSHIP APPOINTMENTS:

05/2008 - 03/2011 Postdoctoral Fellow, Radiology and Imaging Sciences, Clinical Center, National Institutes of Health, Bethesda, MD

FACULTY APPOINTMENTS:

04/2011 - 06/2016 Assistant Professor, Department of Neurosurgery, Medical College of Wisconsin, Milwaukee, WI
06/2016 - Present Associate Professor, Department of Neurosurgery, Medical College of Wisconsin, Milwaukee, WI

ADMINISTRATIVE APPOINTMENTS:

2011 - Present Faculty Member, Cancer Center, Medical College of Wisconsin, Milwaukee, WI
2011 - Present Faculty Member, Center for Imaging Research, Medical College of Wisconsin, Milwaukee, WI
2011 - Present Faculty Member, Neuroscience Research Center, Medical College of Wisconsin, Milwaukee, WI
2012 - Present Faculty Member, Clinical and Translational Scientific Institute of Southeastern Wisconsin, Milwaukee, WI
2014 - Present Faculty Member, Biophysics Graduate Program, Medical College of Wisconsin, Milwaukee, WI

RESEARCH ADMINISTRATIVE APPOINTMENTS:

2013 - Present Director: Confocal Microscopy Core, Clement J. Zablocki VA Medical Center, Milwaukee, WI
2014 - Present Chair - Shared Equipment Committee, Clement J. Zablocki VA Medical Center, Milwaukee, WI

AWARDS AND HONORS:

05/2006 Young Investigator Award Finalist, International Society for Magnetic Resonance in Medicine
05/2010 Junior Fellow Recipient, International Society for Magnetic Resonance in Medicine
02/2011 Fellows Award for Research Excellence (FARE), National Institutes of Health, Bethesda, National Institutes of Health

MEMBERSHIPS IN HONORARY AND PROFESSIONAL SOCIETIES:

11/2005 - Present International Society for Magnetic Resonance in Medicine
11/2005 - Present Society for Neuroscience

EDITORSHIPS/EDITORIAL BOARDS/JOURNAL REVIEWS:

Journal Review
Biological Psychiatry
Brain
Magnetic Resonance in Medicine
Neuroscience Letters
NMR in Biomedicine
Frontiers in Brain Imaging Methods
NeuroImage
PLOSOne
Journal of Magnetic Resonance Imaging
Human Brain Mapping

NATIONAL ELECTED/APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:

2010 - 2011 Session Moderator, Annual Meeting, Intl. Society for Magnetic Resonance in Medicine
2016 - 2018 Ad Hoc Reviewer, Career Development Study Section (RRD9), Department of Veterans Affairs
2016 Ad Hoc Reviewer, Early Career Reviewer Program, National Institutes of Health
2018 - Present Ad-hoc Reviewer, Acute Neural Injury Study Section, National Institutes of Health

INTERNATIONAL ELECTED/APPOINTED LEADERSHIP AND COMMITTEE POSITIONS:

2017 - Present Executive Committee Member, White Matter Study Group, International Society for Magnetic Resonance in Medicine

INVITED LECTURES/WORKSHOPS/PRESENTATIONS:**Local**

The Pathological Features Underlying Diffusion Tensor Imaging Changes in the Injured Rodent Brain, Mouse Imaging Facility Seminar Series, National Institutes of Health, 03/01/2011
Detecting Acute Axonal Injury in Mouse SCI with Diffusion Tensor Imaging, Sanford J Larson, MD PhD, Lecture and Scientific Day, Medical College of Wisconsin, 09/09/2011
The Pathology Underlying Diffusion MRI Abnormalities in the Injured Brain, Department of Biophysics Seminar Series, Medical College of Wisconsin, 10/21/2011
Investigating Traumatic Brain Injury in Animal Models using Diffusion Tensor Imaging, Integrative Neuroscience Research Center Seminar, Marquette University, 10/23/2012
Advanced MRI in Animal Models of Mild Traumatic Brain Injury, Department of Physical Medicine and Rehabilitation Research Grand Rounds, Medical College of Wisconsin, 03/15/2013
Imaging CNS Microstructure with Diffusion MRI: Moving Beyond DTI, Biophysics Departmental Seminar, Medical College of Wisconsin, 11/07/2014
Diffusion MRI in Acute Neurological Injury, Department of Radiology Research Seminar Series, Medical College of Wisconsin, 01/15/2016

Regional

Examining animal models of TBI with MRI: Current Status and Future Directions, New Frontiers in the

Translational Science, Clinical Management and Prevention of Traumatic Brain Injury, Medical College of Wisconsin, 05/17/2012
Investigating Traumatic Brain Injury in Animal Models using Diffusion Tensor Imaging, Bioengineering Department Seminar, University of Illinois-Chicago, 10/02/2012
What can diffusion MRI tell us about brain injury and pathology?, Advanced Imaging Research Center Invited Seminar, Oregon Health Sciences University, 03/19/2014

National

Optical and MR Imaging of Animal Models of Brain Injury, Society for Brain Mapping and Therapeutics, Baltimore, MD, 05/14/2013
Diffusion MRI as a Biomarker in TBI, Correlations, Conclusions, and Caveats, National Neurotrauma Society Annual Meeting, Lexington, KY, 06/27/2016

International

Structure Tensor Analysis of Histological Images to Examine Brain Microstructure, Organization for Human Brain Mapping/Intl Society for Magnetic Resonance in Medicine First Annual Joint Virtual Conference, 07/11/2012
What are the Links of Diffusion Measurements To Histology, ISMRM Workshop on Diffusion MRI, Split, Croatia, 10/14/2013
Validation and Biological Meaning of Diffusion Metrics & Tractography, Organization for Human Brain Mapping Annual Meeting, Honolulu, HI, 06/14/2015
Educational Session: Validation of Inferences about Tissue Microstructure, ISMRM Annual Meeting, Singapore, 05/07/2016
The Pathology Underlying Diffusion MRI Markers of Neurological Injury, Japanese Society for Neuroradiology, Tokyo, Japan, 02/17/2017
Rethinking Diffusion MRI of the Injured Spinal Cord: Rodent Models and Translational Prospects, CPIN Emerging Leaders in Neuroscience Lecture, Toronto, Canada, 06/19/2017
Budde MD, Application of Microstructure/Diffusion-Mediated Signals to Study Disease, International Society for Magnetic Resonance in Medicine, Paris, France, - 06/16/2018

PEER REVIEWED WORKSHOPS/PRESENTATIONS:

International

Budde MD, Kim JH., Klein RS, Russell JH, Cross AH, Song SK., Extensive axonal damage in the spinal cord of EAE mice detected with in vivo DTI., ISMRM Annual Meeting, Miami Beach, FL, 05/13/2005
Budde MD, Song SK, Longitudinal investigation of axonal and myelin damage in the spinal cords of mice with experimental autoimmune encephalomyelitis using in vivo diffusion tensor imaging., Society for Neuroscience Annual Meeting, Washington, DC, 11/13/2005
Budde MD, Liang HF, Cross AH, & Song SK., Axial Diffusivity Correlates with the Degree of Neurological Disability in a Mouse Model of Multiple Sclerosis, ISMRM Annual Meeting, Seattle, WA, 05/08/2006
Budde MD, Kim JH, Klein RS, Russell JH, Cross AH, Song SK., Toward Accurate Diagnosis of White Matter Pathology Using Diffusion Tensor Imaging., ISMRM Annual Meeting, Seattle, WA, 05/08/2006
Budde MD & Frank JA, Neurite Beading is Sufficient to Decrease the Apparent Diffusion Coefficient Following Ischemic Stroke., ISMRM Annual Meeting, Stockholm, Sweden, 05/03/2010
Budde MD, Gold E, Jordan EK, Smith M, Frank JA., Hypoxia Detected with Phase Contrast MRI is an Early Event in Micrometastatic Breast Cancer Development in the Rat Brain., ISMRM Annual Meeting, Stockholm, Sweden, 05/04/2010
Budde MD, Resnick M, Gold E, Jordan EK, Frank JA., Microscopic Morphology of Brain and Bone Metastases in a Rat Breast Cancer Model by Diffusion MRI., ISMRM Annual Meeting, Stockholm, Sweden, 05/04/2010
Budde MD, Janes LA, Gold E, Turtzo LC, Frank JA., Microscopic Determinates of Anisotropy in the Injured Rat Brain using Fourier Analysis of Histological Sections., ISMRM Annual Meeting, Montreal, Canada, 05/11/2011
Budde MD, Structure Tensor Analysis of Histological Images to Examine Brain Microstructure., ISMRM Annual Meeting, Melbourne, Australia, 05/09/2012

Stemper B, Pintar F, Shah A, McCrea M, Kurpad SK, Cullinan W, Olsen C, Thomas D, Budde M,
Differential Effects of Rotational Acceleration Magnitude and Duration on Behavioral Outcomes in
Rats Following Traumatic Brain Injury, International Brain Injury Association World Congress, San
Francisco, CA, 03/20/2014

COMMITTEE SERVICE:

Medical College

2017 - Present Member, Neuroscience Graduate Program Admissions Committee

Hospital

01/01/2013 - Present Member (Non-voting), Research and Development Committee, Clement J. Zablocki
VA Medical Center, Milwaukee, WI

MEDICAL COLLEGE TEACHING ACTIVITIES:

Community/Lay Public

06/2012 Judge: Summer Program for Undergraduate Research

Medical Student Education

Lecturer: Introduction to Medical Imaging

Graduate Student Education

09/2015 - 12/2015 Course Director: Biophysics MRI Journal Club

09/2017 - 12/2017 Course Director: Biophysics MRI Journal Club

MCW STUDENTS, FACULTY, RESIDENTS AND CLINICAL/RESEARCH FELLOWS MENTORED:

Medical Students

John Tejjido, Medical College of Wisconsin, 05/01/2013 - 08/14/2013 Research Pathway Mentor

Graduate Students

PhD Students Advised

Nathan Skinner, Medical College of Wisconsin, 07/2014 - 05/2017 Medical Scientist Training Program

Committees

Zhan Xu, Medical College of Wisconsin, 2015 - Present Biophysics Graduate Program

PhD Committees

Sean McGarry, Medical College of Wisconsin, 08/2016 - 10/2016 Dissertation Committee

Students Advised

Seung Yi Li, Medical College of Wisconsin, 2017 - Present Biophysics

Postdoctoral Students

Elizabeth Zakszewski, Medical College of Wisconsin, 07/2013 - 05/2015 Mentor

**EXTRAMURAL STUDENTS, FACULTY, RESIDENTS, AND CLINICAL/RESEARCH FELLOWS
MENTORED:**

Graduate Students

PhD Committees

Michael Jirjis, Marquette University, 2011 - 2013 Diffusion Tensor Imaging of the Central Nervous
System Following an Injury to the Spinal Cord and Cell Transplant

Committees

Olesya Motovylyak, Marquette University, 2015 - 2018 Biomedical Engineering

BIBLIOGRAPHY

Refereed Journal Publications/Original Papers

1. Cabeza R, Daselaar SM, Dolcos F, Prince SE, **Budde M**, Nyberg L. Task-independent and task-specific age effects on brain activity during working memory, visual attention and episodic retrieval. *Cereb Cortex*. 2004 Apr;14(4):364-75.
2. Cabeza R, Prince SE, Daselaar SM, Greenberg DL, **Budde M**, Dolcos F, LaBar KS, Rubin DC. Brain activity during episodic retrieval of autobiographical and laboratory events: an fMRI study using a novel photo paradigm. *J Cogn Neurosci*. 2004 Nov;16(9):1583-94.
3. Kim JH, **Budde MD**, Liang HF, Klein RS, Russell JH, Cross AH, Song SK. Detecting axon damage in spinal cord from a mouse model of multiple sclerosis. *Neurobiol Dis*. 2006 Mar;21(3):626-32.
4. **Budde MD**, Kim JH, Liang HF, Schmidt RE, Russell JH, Cross AH, Song SK. Toward accurate diagnosis of white matter pathology using diffusion tensor imaging. *Magn Reson Med*. 2007 Apr;57(4):688-95.
5. Kim JH, Trinkaus K, Ozcan A, **Budde MD**, Song SK. Postmortem delay does not change regional diffusion anisotropy characteristics in mouse spinal cord white matter. *NMR Biomed*. 2007 May;20(3):352-9.
6. Haldar JP, Hernando D, **Budde MD**, Wang Q, Song SK, Liang ZP. High-resolution MR metabolic imaging. *Conf Proc IEEE Eng Med Biol Soc*. 2007;2007:4324-6.
7. **Budde MD**, Kim JH, Liang HF, Russell JH, Cross AH, Song SK. Axonal injury detected by in vivo diffusion tensor imaging correlates with neurological disability in a mouse model of multiple sclerosis. *NMR Biomed*. 2008 Jul;21(6):589-97. PMID: PMC2602834
8. **Budde MD**, Xie M, Cross AH, Song SK. Axial diffusivity is the primary correlate of axonal injury in the experimental autoimmune encephalomyelitis spinal cord: a quantitative pixelwise analysis. *J Neurosci*. 2009 Mar 04;29(9):2805-13. PMID: PMC2673458
9. McCandless EE, **Budde M**, Lees JR, Dorsey D, Lyng E, Klein RS. IL-1R signaling within the central nervous system regulates CXCL12 expression at the blood-brain barrier and disease severity during experimental autoimmune encephalomyelitis. *J Immunol*. 2009 Jul 01;183(1):613-20. PMID: PMC2892701
10. Kim JH, Loy DN, Wang Q, **Budde MD**, Schmidt RE, Trinkaus K, Song SK. Diffusion tensor imaging at 3 hours after traumatic spinal cord injury predicts long-term locomotor recovery. *J Neurotrauma*. 2010 Mar;27(3):587-98. PMID: PMC2867549
11. Xie M, Tobin JE, **Budde MD**, Chen CI, Trinkaus K, Cross AH, McDaniel DP, Song SK, Armstrong RC. Rostrocaudal analysis of corpus callosum demyelination and axon damage across disease stages refines diffusion tensor imaging correlations with pathological features. *J Neuropathol Exp Neurol*. 2010 Jul;69(7):704-16. PMID: PMC2901930
12. **Budde MD**, Frank JA. Neurite beading is sufficient to decrease the apparent diffusion coefficient after ischemic stroke. *Proc Natl Acad Sci U S A*. 2010 Aug 10;107(32):14472-7. PMID: PMC2922529
13. Klawiter EC, Schmidt RE, Trinkaus K, Liang HF, **Budde MD**, Naismith RT, Song SK, Cross AH, Benzinger TL. Radial diffusivity predicts demyelination in ex vivo multiple sclerosis spinal cords. *Neuroimage*. 2011 Apr 15;55(4):1454-60. PMID: PMC3062747
14. Kim JH, Wu TH, **Budde MD**, Lee JM, Song SK. Noninvasive detection of brainstem and spinal cord axonal degeneration in an amyotrophic lateral sclerosis mouse model. *NMR Biomed*. 2011 Feb;24(2):163-9. PMID: PMC5180599
15. **Budde MD**, Janes L, Gold E, Turtzo LC, Frank JA. The contribution of gliosis to diffusion tensor anisotropy and tractography following traumatic brain injury: validation in the rat using Fourier analysis of stained tissue sections. *Brain*. 2011 Aug;134(Pt 8):2248-60. PMID: PMC3155707
16. **Budde MD**, Gold E, Jordan EK, Smith-Brown M, Frank JA. Phase contrast MRI is an early marker of micrometastatic breast cancer development in the rat brain. *NMR Biomed*. 2012 May;25(5):726-36. PMID: PMC3252479
17. **Budde MD**, Gold E, Jordan EK, Frank JA. Differential microstructure and physiology of brain and bone metastases in a rat breast cancer model by diffusion and dynamic contrast enhanced MRI. *Clin Exp Metastasis*. 2012 Jan;29(1):51-62. PMID: PMC3233647
18. Thu MS, Bryant LH, Coppola T, Jordan EK, **Budde MD**, Lewis BK, Chaudhry A, Ren J, Varma NR, Arbab AS, Frank JA. Self-assembling nanocomplexes by combining ferumoxytol, heparin and protamine for

- cell tracking by magnetic resonance imaging. *Nat Med.* 2012 Feb 26;18(3):463-7. PMID: PMC3296876
19. **Budde MD**, Frank JA. Examining brain microstructure using structure tensor analysis of histological sections. *Neuroimage.* 2012 Oct 15;63(1):1-10.
 20. Vedantam A, Jirjis MB, Schmit BD, **Budde MD**, Ulmer JL, Wang MC, Kurpad SN. Diffusion tensor imaging and tractography in Brown-Sequard syndrome. *Spinal Cord.* 2012 Dec;50(12):928-30.
 21. Turtzo LC, **Budde MD**, Gold EM, Lewis BK, Janes L, Yarnell A, Grunberg NE, Watson W, Frank JA. The evolution of traumatic brain injury in a rat focal contusion model. *NMR Biomed.* 2013 Apr;26(4):468-79. PMID: PMC3596464
 22. **Budde MD**, Annese J. Quantification of anisotropy and fiber orientation in human brain histological sections. *Front Integr Neurosci.* 2013;7:3. PMID: PMC3561729
 23. Ronen I, **Budde M**, Ercan E, Annese J, Techawiboonwong A, Webb A. Microstructural organization of axons in the human corpus callosum quantified by diffusion-weighted magnetic resonance spectroscopy of N-acetylaspartate and post-mortem histology. *Brain Struct Funct.* 2014 Sep;219(5):1773-85.
 24. **Budde MD**, Shah A, McCrea M, Cullinan WE, Pintar FA, Stemper BD. Primary blast traumatic brain injury in the rat: relating diffusion tensor imaging and behavior. *Front Neurol.* 2013;4:154. PMID: PMC3796287
 25. Leigland LA, **Budde MD**, Cornea A, Kroenke CD. Diffusion MRI of the developing cerebral cortical gray matter can be used to detect abnormalities in tissue microstructure associated with fetal ethanol exposure. *Neuroimage.* 2013 Dec;83:1081-7. PMID: PMC3815979
 26. Li W, Muftuler LT, Chen G, Ward BD, **Budde MD**, Jones JL, Franczak MB, Antuono PG, Li SJ, Goveas JS. Effects of the coexistence of late-life depression and mild cognitive impairment on white matter microstructure. *J Neurol Sci.* 2014 Mar 15;338(1-2):46-56. PMID: PMC4428544
 27. Turtzo LC, Lescher J, Janes L, Dean DD, **Budde MD**, Frank JA. Macrophagic and microglial responses after focal traumatic brain injury in the female rat. *J Neuroinflammation.* 2014 Apr 24;11:82. PMID: PMC4022366
 28. Kamnakh A, **Budde MD**, Kovesdi E, Long JB, Frank JA, Agoston DV. Diffusion tensor imaging reveals acute subcortical changes after mild blast-induced traumatic brain injury. *Sci Rep.* 2014 May 02;4:4809. PMID: PMC4019232
 29. Tu TW, **Budde MD**, Xie M, Chen YJ, Wang Q, Quirk JD, Song SK. Phase-aligned multiple spin-echo averaging: a simple way to improve signal-to-noise ratio of in vivo mouse spinal cord diffusion tensor image. *Magn Reson Imaging.* 2014 Dec;32(10):1335-43. PMID: PMC4252722
 30. Stemper BD, Shah AS, Pintar FA, McCrea M, Kurpad SN, Glavaski-Joksimovic A, Olsen C, **Budde MD**. Head rotational acceleration characteristics influence behavioral and diffusion tensor imaging outcomes following concussion. *Ann Biomed Eng.* 2015 May;43(5):1071-88. PMID: PMC4654450
 31. Miller AP, Shah AS, Aperi BV, **Budde MD**, Pintar FA, Tarima S, Kurpad SN, Stemper BD, Glavaski-Joksimovic A. Effects of blast overpressure on neurons and glial cells in rat organotypic hippocampal slice cultures. *Front Neurol.* 2015;6:20. PMID: PMC4325926
 32. Turtzo LC, **Budde MD**, Dean DD, Gold EM, Lewis BK, Janes L, Lescher J, Coppola T, Yarnell A, Grunberg NE, Frank JA. Failure of intravenous or intracardiac delivery of mesenchymal stromal cells to improve outcomes after focal traumatic brain injury in the female rat. *PLoS One.* 2015;10(5):e0126551. PMID: PMC4422703
 33. Zakszewski E, Schmit B, Kurpad S, **Budde MD**. Diffusion imaging in the rat cervical spinal cord. *J Vis Exp.* 2015 Apr 07(98). PMID: PMC4541495
 34. Lim YW, Meyer NP, Shah AS, **Budde MD**, Stemper BD, Olsen CM. Voluntary Alcohol Intake following Blast Exposure in a Rat Model of Mild Traumatic Brain Injury. *PLoS One.* 2015;10(4):e0125130. PMID: PMC4409117
 35. Jirjis MB, Vedantam A, **Budde MD**, Kalinosky B, Kurpad SN, Schmit BD. Severity of spinal cord injury influences diffusion tensor imaging of the brain. *J Magn Reson Imaging.* 2016 Jan;43(1):63-74.
 36. Baron CA, Kate M, Gioia L, Butcher K, Emery D, **Budde M**, Beaulieu C. Reduction of Diffusion-Weighted Imaging Contrast of Acute Ischemic Stroke at Short Diffusion Times. *Stroke.* 2015 Aug;46(8):2136-41.
 37. Skinner NP, Kurpad SN, Schmit BD, **Budde MD**. Detection of acute nervous system injury with advanced diffusion-weighted MRI: a simulation and sensitivity analysis. *NMR Biomed.* 2015 Nov;28(11):1489-506.
 38. Oni-Orisan A, Kaushal M, Li W, Leschke J, Ward BD, Vedantam A, Kalinosky B, **Budde MD**, Schmit BD,

- Li SJ, Muqet V, Kurpad SN. Alterations in Cortical Sensorimotor Connectivity following Complete Cervical Spinal Cord Injury: A Prospective Resting-State fMRI Study. *PLoS One*. 2016;11(3):e0150351. PMID: PMC4783046
39. Stemper BD, Shah AS, **Budde MD**, Olsen CM, Glavaski-Joksimovic A, Kurpad SN, McCrea M, Pintar FA. Behavioral Outcomes Differ between Rotational Acceleration and Blast Mechanisms of Mild Traumatic Brain Injury. *Front Neurol*. 2016;7:31. PMID: PMC4789366
40. Skinner NP, Kurpad SN, Schmit BD, Tugan Muftuler L, **Budde MD**. Rapid in vivo detection of rat spinal cord injury with double-diffusion-encoded magnetic resonance spectroscopy. *Magn Reson Med*. 2017 04;77(4):1639-1649. PMID: PMC5285487
41. Stemper BD, Shah AS, Chiariello R, Olsen CM, **Budde MD**, Glavaski-Joksimovic A, McCrea M, Kurpad SN, Pintar FA. Prediction of Post-Concussive Behavioral Changes in a Rodent Model Based on Head Rotational Acceleration Characteristics. *Ann Biomed Eng*. 2016 Nov;44(11):3252-3265. PMID: PMC5093216
42. Kaushal M, Oni-Orisan A, Chen G, Li W, Leschke J, Ward BD, Kalinosky B, **Budde MD**, Schmit BD, Li SJ, Muqet V, Kurpad SN. Evaluation of Whole-Brain Resting-State Functional Connectivity in Spinal Cord Injury: A Large-Scale Network Analysis Using Network-Based Statistic. *J Neurotrauma*. 2017 03 15;34(6):1278-1282.
43. Kaushal M, Oni-Orisan A, Chen G, Li W, Leschke J, Ward D, Kalinosky B, **Budde M**, Schmit B, Li SJ, Muqet V, Kurpad S. Large-Scale Network Analysis of Whole-Brain Resting-State Functional Connectivity in Spinal Cord Injury: A Comparative Study. *Brain Connect*. 2017 09;7(7):413-423.
44. Martin AR, Tadokoro N, Tetreault L, Arocho-Quinones EV, **Budde MD**, Kurpad SN, Fehlings MG. Imaging Evaluation of Degenerative Cervical Myelopathy: Current State of the Art and Future Directions. *Neurosurg Clin N Am*. 2018 Jan;29(1):33-45.
45. **Budde MD**, Skinner NP, Muftuler LT, Schmit BD, Kurpad SN. Optimizing Filter-Probe Diffusion Weighting in the Rat Spinal Cord for Human Translation. *Front Neurosci*. 2017;11:706. PMID: PMC5742102
46. Rao A, Soliman H, Kaushal M, Motovylyak O, Vedantam A, **Budde MD**, Schmit B, Wang M, Kurpad SN. Diffusion Tensor Imaging in a Large Longitudinal Series of Patients With Cervical Spondylotic Myelopathy Correlated With Long-Term Functional Outcome. *Neurosurgery*. 2018 10 01;83(4):753-760.
47. Jelescu IO, **Budde MD**. Design and validation of diffusion MRI models of white matter. *Front Phys*. 2017 11;28. PMID: PMC5947881
48. Skinner NP, Lee SY, Kurpad SN, Schmit BD, Muftuler LT, **Budde MD**. Filter-probe diffusion imaging improves spinal cord injury outcome prediction. *Ann Neurol*. 2018 Jul;84(1):37-50. PMID: PMC6119508
49. **Budde MD**, Skinner NP. Diffusion MRI in acute nervous system injury. *J Magn Reson*. 2018 Jul;292:137-148.
50. Muelbl MJ, Slaker ML, Shah AS, Nawarawong NN, Gerndt CH, **Budde MD**, Stemper BD, Olsen CM. Effects of Mild Blast Traumatic Brain Injury on Cognitive- and Addiction-Related Behaviors. *Sci Rep*. 2018 Jul 02;8(1):9941. PMID: PMC6028456
51. Motovylyak A, Skinner NP, Schmit BD, Wilkins N, Kurpad SN, **Budde MD**. Longitudinal In Vivo Diffusion Magnetic Resonance Imaging Remote from the Lesion Site in Rat Spinal Cord Injury. *J Neurotrauma*. 2018 Nov 19.
52. Nawarawong NN, Slaker M, Muelbl M, Shah AS, Chiariello R, Nelson LD, **Budde MD**, Stemper BD, Olsen CM. Repeated blast model of mild traumatic brain injury alters oxycodone self-administration and drug seeking. *Eur J Neurosci*. 2018 Nov 20.

Books, Chapters, and Reviews

1. **Budde MD**, and Song SK. Insights into Diffusion Tensor Imaging from Animal Models of White Matter Pathology. In *Diffusion MRI: Theory, Methods, and Applications*. Derek K. Jones, editor. Oxford University Press. 2010.
2. **Budde MD**., Frank JA. Focus on Molecular Imaging: Magnetic Tagging of Therapeutic Cells for MRI. *J. Nuc Med*. 2009; 50 (2). 171-4.
3. Gammon ST, Foje N, Brewer EM, Owers E, Downs CA, **Budde MD**, Leevy WM, Helms MN. Preclinical anatomical, molecular, and functional imaging of the lung with multiple modalities. *Am J Physiol Lung Cell Mol Physiol*. 2014 May 15;306(10):L897-914.

Abstracts

1. Binzak, JM., Budde, MD., Robertson, DA., Gernsbacher, MA. Suppression of Irrelevant Meanings of Homographs. Poster presentation, Cognitive Neuroscience Society Annual Meeting. 2001
2. Prince, S., Budde, M., Daselaar, S., Dolcos, F., & Cabeza, R. Encoding and retrieval of semantic and perceptual word pair associations: A functional MRI study. Poster presentation, Cognitive Neuroscience Society Annual Meeting. 2003
3. Dolcos, F., Budde, M., LaBar, K., & Cabeza, R. Remembering one year later: Role of the amygdala in retrieving consolidated emotional memories. Poster presentation, Cognitive Neuroscience Society Annual Meeting. 2003
4. Daselaar, S. M., Prince, S.E., Dolcos, F., Nyberg, L., Budde, M., & Cabeza, R. Differentiating global and task-specific age effects on brain activity: A cross-function fMRI study. Poster presentation, Cognitive Neuroscience Society Annual Meeting. 2003
5. Budde, M., Prince, SE., Daselaar, SM., Greenberg, D., Rubin, D., LaBar, K., & Cabeza, R. A new method for investigating autobiographical memory in the fMRI environment. Poster presentation, Cognitive Neuroscience Society Annual Meeting. 2003
6. Cabeza, R., Prince, SE., Budde, M., Daselaar, SM., Greenberg, D., LaBar, K. & Rubin, D.. Comparing the neural correlates of autobiographical and laboratory memory with the new fMRI paradigm. Poster presentation, Soc. for Neuroscience Annual Meeting. 2003
7. Kim, JH., Budde, MD., Neil, JJ., Song, SK. Reproducibility of in Vivo DTI Mouse Spinal Cord. Poster presentation, Proc. Int. Soc. Magn Res Med. 2005
8. Budde, MD., Kim, JH., Klein, RS., Russell, JH., Cross, AH., Song, SK. Extensive axonal damage in the spinal cord of EAE mice detected with in vivo DTI. Oral presentation, Proc. Int. Soc. Magn Res Med. 2005
9. Budde, MD., Song, SK., Longitudinal Investigation of Axonal and Myelin Damage in the Spinal Cords of Mice with EAE Using In Vivo DTI. Oral Presentation, Soc. for Neuroscience Annual Meeting, Washington D.C. 2005
10. Budde, MD., Kim, JH., Liang, HF., Cross, AH., Song, SK. Axial diffusivity correlates with the degree of neurological disability in a mouse model of Multiple Sclerosis. Oral presentation, Proc. Int. Soc. Magn Res Med. 2006
11. Budde, MD., Kim, JH., Klein, RS., Russell, JH., Cross, AH., Song, SK. Toward Accurate Diagnosis of White Matter Pathology Using Diffusion Tensor Imaging. Oral presentation, Proc. Int. Soc. Magn Res Med. 2006
12. Budde, MD., Kim, JH., Xie, M., Liang, HF., Cross, AH., Song, SK. Decreased axial diffusivity as a biomarker of axonal injury in the spinal cord white matter of mice with EAE validated with immunofluorescence. Poster presentation, Proc. Int. Soc. Magn Res Med. 2007
13. Benzinger, TL., Liang, HS., Budde, MD., Sun, S., Cross DA., Schmidt, R., Song, SK. Axial and Radial Diffusivity as MR Biomarkers of Axonal and Myelin Injury in Ex-Vivo Cervical Spinal Cord from Multiple Sclerosis Patients. Oral presentation, Proc. Int. Soc. Magn Res Med. 2007
14. Haldar JP, Hernando D, **Budde MD**, Wang Q, Song SK, Liang ZP. High-resolution MR metabolic imaging. Conf Proc IEEE Eng Med Biol Soc. 2007:4324-6.
15. Budde, MD., Song, SK. Relating spinal cord axonal damage and neurological impairment in EAE using in vivo DTI. Poster presentation, Bi-annual Minnesota Workshops on High Field MR Imaging and Spectroscopy. Minneapolis. 2007
16. Budde, MD., Song, SK. Noninvasive detection of axonal damage: Spinal cord MRI in a mouse model of Multiple Sclerosis. Poster presentation, at NIH Graduate Student Research Festival. 2007
17. Budde, MD., Song, SK. Focal lesions do not cause neurological impairment in EAE: Correlating histology with in vivo DTI. Poster presentation, Proc. Int. Soc. Magn Res Med. 2008
18. Budde, MD., Jordan, EK., Smith, M., Gold, E., Frank, JA. BOLD changes in the microenvironment are an early marker of micrometastatic breast cancer in the rat brain. Poster presentation, Proc. Int. Soc. Magn Res Med. 2009
19. Xie, M., Budde, MD., Chen, CI., Trinkaus, K., Armstrong, RC., Cross, AH., Song, SK. Pathological Correlates of the Decreased Axial Diffusivity in White Matter Injury. Oral presentation, Proc. Int. Soc. Magn Res Med. 2009
20. **Budde MD**, Resnick M, Gold E, Jordan EK, Frank JA. Microscopic Morphology of Brain and Bone Metastases in a Rat Breast Cancer Model by Diffusion MRI. Oral presentation, Proc. Int. Soc. Magn Res Med. 2010
21. **Budde MD**, Gold E, Jordan EK, Smith M, Frank JA. Hypoxia Detected with Phase Contrast MRI is an Early Event in Micrometastatic Breast Cancer Development in the Rat Brain. Oral presentation, Proc. Int.

- Soc. Magn Res Med. 2010
22. **Budde MD**, Janes LA, Gold E, Turtzo LC, Frank JA. Microscopic Determinates of Anisotropy in the Injured Rat Brain using Fourier Analysis of Histological Sections. Oral presentation, Proc. Int. Soc. Magn Res Med. 2011
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