
CURICULLUM VITAE



PETR BEDNARIK, MD, Ph.D.

CLINICAL AND RESEARCH INTERESTS:

○ **Clinical Radiology and Neuroradiology**

During the initial eight years of my career, I have obtained a solid clinical and research background in Radiology with a particular emphasis on neuroimaging and neurovascular interventions. I have finalized board certification in Radiology and participated in critical presurgical evaluations of patients with epilepsy and brain tumors.

a. Rektor I, Goldemund D, **Bednařík P**, Sheardová K, Michálková Z, Telecká S, Dufek M, Rektorová I. Impairment of brain vessels may contribute to mortality in patients with Parkinson's disease. *Mov Disord.* 2012 Aug;27(9):1169-72. doi: 10.1002/mds.25066.

○ **Functional Magnetic Resonance Spectroscopy (fMRS)**

Having an exceptional level of neuroimaging expertise, I successfully obtained Interbionet funding to support my first year of full-time research career as a visiting scholar at the Center for Magnetic Resonance Research (CMRR), Department of Radiology, University of Minnesota. At the CMRR, I gained invaluable research experience in proton MRS as well as multimodal and functional neuroimaging. I became a productive member of the state-of-the-art research institution working on high (3T) and ultra-high (7T) field human MR scanners to translate the methodological development achievements into applications answering essential questions in neuroscience and clinical research. Prof. Mangia and Dr. Tkac supervised my Ph.D. thesis. My manuscript entitled "Neurochemical and BOLD responses during neuronal activation measured in the human visual cortex at 7 Tesla" established semi-LASER at 7 T as a sensitive tool to investigate metabolite responses to sensory stimulation in the human brain in vivo, received significant attention and was awarded by the Czech Radiological Society as the best publication. This approach has been successfully applied in several projects, including the study of chromatic and achromatic stimuli, neuronal inhibition, hypoxia, and neuromodulation interventions. One of my conference contributions received ISMRM Merit Award: Magna cum Laude.

a. **Bednařík P**, Tkáč I, Giove F, Eberly LE, Deelchand DK, Barreto FR, Mangia S. [Neurochemical responses to chromatic and achromatic stimuli in the human visual cortex.](#) *J Cereb Blood Flow Metab.* 2018 Feb;38(2):347-359. doi: 10.1177/0271678X17695291.

b. **Bednařík P**, Tkáč I, Giove F, DiNuzzo M, Deelchand DK, Emir UE, Eberly LE, Mangia S. [Neurochemical and BOLD responses during neuronal activation measured in the human visual cortex at 7 Tesla.](#) *J Cereb Blood Flow Metab.* 2015 Mar 31;35(4):601-10. doi: 10.1038/jcbfm.2014.233.

c. Gröhn H, Gillick BT, Tkáč I, **Bednařík P**, Mascali D, Deelchand DK, Michaeli S, Meekins GD, Leffler-McCabe MJ, MacKinnon CD, Eberly LE, Mangia S. [Influence of Repetitive Transcranial Magnetic Stimulation on Human Neurochemistry and Functional Connectivity: A Pilot MRI/MRS Study at 7 T.](#) *Front Neurosci.* 2019;13:1260. doi: 10.3389/fnins.2019.01260.

d. **Bednarik P**, Tkac I, Giove F, Deelchand D, Eberly L, Barreto F a Mangia S. Neurochemical and BOLD Responses in Activated Blob and Interblob Neuronal Populations Measured in the Human Visual Cortex at 7T, ISMRM 2015, Toronto. **ISMRM Merit Award: Magna cum laude.** [oral presentation]

○ **Validation and Applications of MRS**

My training in MRS was substantially enriched by counseling of Prof. Gülin Öz, who supervised my project utilizing advanced MRS methodology in the human hippocampus at 3T. The manuscript summarizing our findings had an outstanding level of spectral reproducibility and was selected as Editor's Pick article in NMR in Biomedicine. After one year in Minneapolis, I was hired as a Research Associate to conduct MRI/MRS projects at the Department of Diabetes, Endocrinology, and Metabolism; University of Minnesota (Prof. Elizabeth Seaquist). Our core study focused on investigating differences in hippocampal glucose transport between healthy individuals and patients with diabetes. In addition, I supported another study aiming at test-retest reproducibility of neurochemical quantifications at both 3T and 7T.

a. Bednařík P, Moheet A, Deelchand DK, Emir UE, Eberly LE, Bareš M, Seaquist ER, Öz G. [Feasibility and reproducibility of neurochemical profile quantification in the human hippocampus at 3T](#). NMR Biomed. 2015 Jun;28(6):685-93. doi: 10.1002/nbm.3309. **Correspondence author.**

b. Bednařík P, Henry PG, Khowaja A, Rubin N, Kumar A, Deelchand D, Eberly LE, Seaquist E, Öz G, Moheet A. [Hippocampal Neurochemical Profile and Glucose Transport Kinetics in Patients With Type 1 Diabetes](#). J Clin Endocrinol Metab. 2020 Feb 1;105(2). doi: 10.1210/clinem/dgz062.

c. Terpstra M, Cheong I, Lyu T, Deelchand DK, Emir UE, **Bednařík P**, Eberly LE, Öz G. [Test-retest reproducibility of neurochemical profiles with short-echo, single-voxel MR spectroscopy at 3T and 7T](#). Magn Reson Med. 2016 Oct;76(4):1083-91.

○ **Magnetic Resonance Imaging in type I diabetes and neurodegenerative diseases**

Besides spectroscopy projects, my work in the team of Dr. Seaquist and Dr. Mangia includes multiple neuroimaging projects which were focused on identifying structural and functional correlates of type 1 diabetes. More specifically, the projects are seeking brain alterations associated with cognitive deficit and hypoglycemia unawareness syndrome. My contribution includes image segmentation and volumetry, mapping microstructural changes with T1w/T2w ratio contrast, and the acquisition and analysis of the ASL (arterial spin labeling) data. The outcomes were presented at national and international meetings, and the manuscript reporting volume brain changes. We observed prominent structural effects in patients with impaired awareness of hypoglycemia compared to those with normal awareness. This study outcome will be critical for further studies. During my training, I utilized my MRI data processing skills using Linux and MATLAB and contributed to several MRI studies in patients with Parkinson's disease and multiple sclerosis.

a. Bednarik P, Moheet AA, Grohn H, Kumar AF, Eberly LE, Seaquist ER, Mangia S. [Type 1 Diabetes and Impaired Awareness of Hypoglycemia Are Associated with Reduced Brain Gray Matter Volumes](#). Front Neurosci. 2017;11:529. doi: 10.3389/fnins.2017.00529.

b. Filip P, Canna A, Moheet A, **Bednarik P**, Grohn H, Li X, Kumar AF, Olawsky E, Eberly LE, Seaquist ER, Mangia S. [Structural Alterations in Deep Brain Structures in Type 1 Diabetes](#). Diabetes. 2020 Nov;69(11):2458-2466. doi: 10.2337/db19-1100.

c. Mangia S, Svatkova A, Mascali D, Nissi MJ, Burton PC, Bednarik P, Auerbach EJ, Giove F, Eberly LE, Howell MJ, Nestratil I, Tuite PJ, Michaeli S. [Multi-modal Brain MRI in Subjects with PD and iRBD](#). Front Neurosci. 2017;11:709. doi: 10.3389/fnins.2017.00709.

○ **Magnetic Resonance Imaging and spectroscopy in the spine**

I served as a coinvestigator on an international collaborative project focused on imaging and spectroscopy of the cervical spinal cord. I am the last author on a successful ISMRM oral presentation and a manuscript written by my PhD student Tomas Horak, MD, which was published in the Journal of Neurotrauma.

a. Valošek J, Labounek R, Horák T, Svátková A, Kudlička P, Hok P, Kočica J, Lenglet C, Hlušík P, **Bednařík J**, **Bednařík P**. Column-specific microstructural changes in patients with non-myelopathic degenerative compression of the cervical spinal cord revealed by diffusion MRI. ISMRM 2019. Montreal. Canada. 2019

b. Valošek J, Labounek R, Horák T, Horáková M, **Bednařík P**, Keřkovský M, Kočica J, Rohan T, Lenglet C, Cohen-Adad J, Hlušík P, Vlčková E, Kadaňka Z Jr, Bednařík J, Svatkova A. [Diffusion magnetic resonance imaging reveals tract-specific microstructural correlates of electrophysiological impairments in non-myelopathic and myelopathic](#)

[spinal cord compression](#). Eur J Neurol. 2021 Nov;28(11):3784-3797. doi: 10.1111/ene.15027. Epub 2021 Aug 4. PMID: 34288268

c. Horak T, Horakova M, Svatkova A, Kadanka Z Jr., Kudlicka P, Valosek J, Rohan T, Kerkovsky M, Vlckova E, Kadanka Z, Deelchand D, Henry PG, Bednarik J, **Bednarik P**. [In vivo molecular signatures of cervical spinal cord pathology in degenerative compression](#). Journal of Neurotrauma. 2021;38(21):2999-3010. doi: 10.1089/neu.2021.0151.

○ **Functional Magnetic Resonance Spectroscopic Imaging (fMRSI)**

I have been working on the development of functional MRSI under the supervision of prof. Bogner during the last three years at the Medical University of Vienna. My research has been internationally recognized. I was awarded several grants and awards, including the prestigious American NARSAD young investigator award from the Brain and Behavior research foundation and the European Marie-Curie individual fellowship with an excellent evaluation of 97%. My oral presentations presenting fMRSI data received ISMRM merit award.

a. **Bednarik P**, Spurny B, Silberbauer L, Svatkova A, Handschuh P, Reiter B, Konadu M, Stimpfl T, Spies M, Bogner W, Lanzenberger R. [Effect of ketamine on human neurochemistry in posterior cingulate cortex: A pilot magnetic resonance spectroscopy study at 3 Tesla](#). Frontiers in Neuroscience. Section Neuropharmacology.

b. Heckova E, Strasser B, Hangel GJ, Považan M, Dal-Bianco A, Rommer PS, **Bednarik P**, Gruber S, Leutmezer F, Lassmann H, Trattnig S, Bogner W. [7 T Magnetic Resonance Spectroscopic Imaging in Multiple Sclerosis: How Does Spatial Resolution Affect the Detectability of Metabolic Changes in Brain Lesions?](#) Invest Radiol. 2019 Apr;54(4):247-254. doi: 10.1097/RLI.0000000000000531.

c. Silberbauer LR, Spurny B, Handschuh P, Klöbl M, **Bednarik P**, Reiter B, Ritter V, Trost P, Konadu ME, Windpassinger M, Stimpfl T, Bogner W, Lanzenberger R, Spies M. [Effect of Ketamine on Limbic GABA and Glutamate: A Human In Vivo Multivoxel Magnetic Resonance Spectroscopy Study](#). Front Psychiatry. 2020;11:549903. doi: 10.3389/fpsy.2020.549903

d. **Bednarik P.**, Hingerl L., Goranovic D., Svatkova A., de Lima Cardoso P., Trattnig S., Lanzenberger R., Bogner W. Functional spectroscopic imaging (fMRSI) detects metabolite changes in the activated primary sensorimotor cortex at 7T, ISMRM 2020. **ISMRM Merit Award: Summa cum laude.**

e. Hangel G, Niess E, Lazen P, **Bednarik P**, Bogner W, Strasser B. [Emerging methods and applications of ultra-high field MR spectroscopic imaging in the human brain](#). Anal Biochem. 2022 Feb 1;638:114479. doi: 10.1016/j.ab.2021.114479. Epub 2021 Nov 24. PMID: 34838516

QUALIFICATIONS AND EDUCATION:

- 07/03/2017 **Ph.D. in Neuroscience**, Masaryk University, Brno, Czech Republic
Title of the PhD thesis: Advanced Proton Magnetic Resonance Spectroscopy: Clinical and Basic Neuroscience Applications.
Mentors: Assoc. Prof. Silvia Mangia PhD, Dr. Ivan Tkac, PhD (University of Minnesota, CMRR, Minneapolis, USA), Prof. Dr. Ivan Rektor, PhD (CEITEC, Masaryk University, Brno, Czech Republic).
- 28/11/2008 **Board certification in Radiology**, Ministry of Health, Czech Republic
- 09/05/2003 Faculty of Medicine, Masaryk University, Brno, Czech Republic, **M.D. diploma**

EMPLOYMENT HISTORY:

- 2020-2021 **teaching assistant**, High Field MR Center, Department of Biomedical Imaging and Image-guided Therapy, Medical University of Vienna
- 04/2018-2021 **EU scientific employee**, High Field MR Center, Department of Biomedical Imaging and Image-guided Therapy, Medical University of Vienna
- 2017-2018 **teaching assistant**, Department of Radiology, University of Ostrava, Ostrava, Czech Republic
- 2016-2018 (2 years) **Post-doctoral Associate**, Center for Magnetic Resonance Research (CMRR), Department of Radiology, University of Minnesota, USA

- 2013 -2016 (4 years) **Research Associate** at the Division of Endocrinology and Diabetes, Department of Medicine, University of Minnesota, USA (Prof. Elizabeth Seaquist)
- 2011-2016 (5 years) **visiting scholar**, Center for Magnetic Resonance Research, Department of Radiology, University of Minnesota, USA (Prof. Silvia Mangia, PhD)
- 2012-2017 (part time) - **PhD student** (Neuroscience)/**Medical Specialist** at Multimodal and Functional Imaging Laboratory, Central European Institute of Technology (CEITEC), Brno, Czechia
- 2008-2011 (3 years) **specialist in general radiology** with special interests in **neuroimaging** and **vascular interventional neuroradiology**, Dept. of Clinical Imaging in St. Anne`s University Hospital, Masaryk University, Brno, Czechia
- 2003 –2008 (5 years) **a trainee in general radiology**, Dept. of Clinical Imaging, St. Anne`s University Hospital, Brno, Czechia

TEACHING ACTIVITIES

- **Co-supervisor of Master student** Bc. Dario Goranovic at MUW (finished)
- **Current supervisor of PhD students** Ing. Petr Kudlicka (Neuroscience) and Dr. Tomas Horak (Neurology)
- Teaching of several **fellows on doctoral and postdoctoral level** to optimize MRS acquisition protocols (at 3T and 7T), acquisition and processing of MRS and functional MRS data for their projects at the CMRR (Heidi Gröhn, PhD, Felipe R. Barreto, PhD)
- **Supervision of Bachelor thesis** of radiological assistant Jan Hloušek, Czech Republic
- Lecturer in hands-on training in the **Minnesota spectroscopy workshop** 2015, 2017, 2019
- Educational talk at the **Minnesota spectroscopy meeting** 2013, ‘Hot topics: Functional MRS’
- **2009 -2011 teaching assistant** at the Department of Clinical Imaging, St. Anne`s University Hospital, Masaryk University, Brno, Czech Republic. Extensive teaching of Czech and International **medical students**
- **2017-2018 teaching assistant** at the Department of Radiology, University Hospital Ostrava, Czech Rep.
- **2020-2021 teaching assistant** at the Medical University of Vienna, CLINS seminar: Diffusion in Neuroimaging (seminar for Neuroscience PhD students)

PEER REVIEWED ARTICLES:

486 citations, H index = 10 (google scholar), summary IF ~60

<https://scholar.google.com/citations?user=mh3gliQAAAAJ&hl=en>

https://www.ncbi.nlm.nih.gov/myncbi/1-Ys5_95Op6QF/bibliography/public/

- **Bednarik P**, Spurny B, Silberbauer L, Svatkova A, Handschuh P, Reiter B, Konadu M, Stimpfl T, Spies M, Bogner W, Lanzenberger R. Effect of ketamine on human neurochemistry in posterior cingulate cortex: A pilot magnetic resonance spectroscopy study at 3 Tesla. *Frontiers in Neuroscience. Section Neuropharmacology*. **Correspondence author.**
- Horak T, Horakova M, Svatkova A, Kadanka Z Jr., Kudlicka P, Valosek J, Rohan T, Kerkovsky M, Vlckova E, Kadanka Z, Deelchand D, Henry PG, Bednarik J, **Bednarik P**. In vivo molecular signatures of cervical spinal cord pathology in degenerative compression. *Journal of Neurotrauma*. 2021;38(21):2999-3010. doi: 10.1089/neu.2021.0151.
- **Bednařik P**, Henry PG, Khowaja A, Rubin N, Kumar A, Deelchand D, Eberly L, Seaquist E, Öz G, Moheet A, Hippocampal neurochemical profile and glucose transport kinetics in patients with type 1 diabetes, *J Clinical Endocrinol Metab*, 2019.
- **Bednarik P**, Moheet A, Grohn H, Kumar A, Eberly L, Seaquist E, Mangia S. Impact of type 1 diabetes and of awareness status to hypoglycemia on brain grey matter volumes. *Frontiers in Neuroscience. Front Neurosci*. 2017 Sep 25; 11:529.
- **Bednarik P**, Tkac I, Giove F, Eberly L, Deelchand D, Barreto F, Mangia S. Neurochemical Responses to Chromatic and Achromatic Stimuli in the Human Visual Cortex. *J Cereb Blood Flow Metab* 2018;38(2):347-359.

- **Bednarik P**, Tkac I, Giove F, DiNuzzo M, Deelchand DK, Emir UE, Eberly LE, Mangia S. Neurochemical and BOLD responses during neuronal activation measured in the human visual cortex at 7 Tesla. *J Cereb Blood Flow Metab* 2015; 35: 601-610. **Awarded by the Czech Radiological Society as the best paper 2014-2016.**
- **Bednarik P**, Moheet A, Deelchand DK, Emir UE, Eberly LE, Bares M, Seaquist ER, Oz G. Feasibility and reproducibility of neurochemical profile quantification in the human hippocampus at 3 T. *NMR Biomed* 2015; 28: 685-693. **Correspondence author. Editor's Pick Article.**
- Terpstra M, Cheong I, Lyu T, Deelchand DK, Emir UE, **Bednarik P**, Eberly LE, Oz G. Test-retest reproducibility of neurochemical profiles with short-echo, single-voxel MR spectroscopy at 3T and 7T. *Magn Reson Med* 2016; 76: 1083-1091. **Editor's Pick Article.**
- Gröhn H, Gillick BT, Tkác I, **Bednarik P**, Mascali D, Deelchand DK, Michaeli S, Meekins GD, Leffler-McCabe MJ, MacKinnon CD, Eberly LE and Mangia S (2019) Influence of Repetitive Transcranial Magnetic Stimulation on Human Neurochemistry and Functional Connectivity: A Pilot MRI/MRS Study at 7 T. *Front. Neurosci.* 13:1260.
- Filip P., Canna A., Moheet A., **Bednarik P.**, Grohn H., Li X., Kumar A., Olawsky E., Eberly L.m Seaquist E., Mangia S. Structural alterations in deep brain structures in type 1 diabetes. *Diabetes.* 2021
- Silberbauer L, Spurny B, Handschuh P, Klöbl M, **Bednarik P**, Reiter B, Ritter V, Trost P, Konadu M, Windpassinger M, Stimpfl T, Bogner W, Lanzenberger R, Spies M. Effect of ketamine on limbic GABA and glutamate: A human *in vivo* multi-voxel magnetic resonance spectroscopy study. *Frontiers Neuroscience.*
- Heckova E, Strasser B, Hangel GJ, Považan M, Dal-Bianco A, Rommer PS, **Bednarik P**, Gruber S, Leutmezer F, Lassmann H, Trattinig S, Bogner W. 7 T Magnetic Resonance Spectroscopic Imaging in Multiple Sclerosis: How Does Spatial Resolution Affect the Detectability of Metabolic Changes in Brain Lesions? *Invest Radiol.* 2018.
- Labounek R.; Valošek, J.; Horak, T.; Svatkova, A.; **Bednařik, P.**; Vojtišek, L.; Horakova, M.; Nestršil, I., Lenglet, Ch.; Cohen-Adad, J.; Bednařik, J.; Hluštík, P. HARDI-ZOOMit protocol improves sensitivity to microstructural changes in presymptomatic myelopathy. *Scientific Reports.* 2020
- Labounek R, Bridwell D, Mareček R, Lamoš M, Mikl M, Slavíček T, **Bednarik P**, Baštinec J, Hluštík P, Brázdil M., Jan J. Stable scalp EEG spatio-spectral patterns across paradigms estimated by group ICA. *Brain Topography* 2018.;31(1):76-89.
- Labounek R, Bridwell DA, Mareček R, Lamoš M, Mikl M, **Bednařik P**, Baštinec J, Slavíček T, Hluštík P, Brázdil M, Jan J. EEG spatio-spectral patterns and their link to fMRI BOLD signal via variable hemodynamic response functions. *J Neurosci Methods.* 2019.
- Nestršil I, Svatkova A, Rudser KD, Chityala R, Wakumoto A, Mueller BA, **Bednarik P**, Tuite P, Wu X, Bushara K. White matter measures correlate with essential tremor severity-A pilot diffusion tensor imaging study. *Brain Behav.* 2018
- Mangia S, Svatkova A, Mascali D, Nissi MJ, Burton PC, **Bednarik P**, Auerbach EJ, Giove F, Eberly LE, Howell MJ, Nestršil I, Tuite PJ, Michaeli S. Multi-modal Brain MRI in Subjects with PD and iRBD. *Front Neurosci.* 2017; 11:709.
- Rektor I, Goldemund D, **Bednarik P**, Sheardova K, Michalkova Z, Telecka S, Dufek M, Rektorova I. Impairment of brain vessels may contribute to mortality in patients with Parkinson's disease. *Mov Disord* 2012; 27: 1169-1172.
- Obhlidalova I, Kerkovsky M, Stourac P, **Bednarik P**, Vlckova E. Imaging Techniques to Evaluate Morphological Correlates of Cognitive Dysfunction in Multiple Sclerosis Patients. *Cesk Slov Neurol N* 2012; 75: 170-178.

CONFERENCE PAPERS

- Horak T., Bednarik J., Horakova M., Svatkova A., Kadanka Z., Fabikova V., Kudlicka P., **Bednarik P.** Proton (1H) magnetic resonance spectroscopy (MRS) in degenerative cervical spinal cord compression (DCSCC). In 5th Congress of the European Academy of Neurology 29.6.-2.7.2019. 2019. ISSN 1351-5101.
- Labounek R, Valošek J, Zimolka J, Piskořová Z, Horák T, Svátková A, **Bednařik P**, Hok P, Vojtišek L, Hluštík P, Bednařik K, Lenglet C. Fast In Vivo High-Resolution Diffusion MRI of the Human Cervical Spinal Cord Microstructure. International symposium on Biomedical Imaging. Prague 2018.

- Labounek R, Janecek D, Marecek R, Lamos M, Slavicek T, Mikl M, Bastinec J, **Bednarik P**, Bridwell D, Brazdil M, Jan J. Generalized EEG-fMRI Spectral and Spatiospectral Heuristic Models. International symposium on Biomedical Imaging. Prague 2016.
- Zimolka J, Piskorova Z, Svatkova A, **Bednarik P**, Horak T, Hok P, Bednarik J, Lenglet C, Labounek R. HARDI dMRI imaging of cervical spinal cord. 23rd Conference STUDENT EEICT 2017, At Brno: Brno University of Technology.

BOOK CHAPTER

- Bogner W, Strasser B, **Bednarik P**, Heckova E, Hingerl L, Hangel G: Magnetic Resonance Spectroscopic Imaging: Principles and Applications. Book chapter in Advanced Neuro MR Techniques and Applications edited by Peter Jezzard. [under review]

TALKS

- **Bednarik P.**, Hingerl L., Goranovic D., Svatkova A., de Lima Cardoso P., Trattnig S., Lanzenberger R., Bogner W. Functional spectroscopic imaging (fMRSI) detects metabolite changes in the activated primary sensorimotor cortex at 7T, ISMRM 2020. **ISMRM Merit Award: Summa cum laude.**
- **Bednarik P.**, Svatkova A., Deelchand D., Silani G., Lanzenberger R., Bogner W. Feasibility of functional spectroscopy at a clinical 3T MR scanner. 2019. ESMRMB, Rotterdam.
- Valošek J, Labounek R, Horák T, Svátková A, Kudlička P, Hok P, Kočica J, Lenglet C, Hlušík P, Bednařík J, **Bednařík P.** Column-specific microstructural changes in patients with non-myelopathic degenerative compression of the cervical spinal cord revealed by diffusion MRI. Proceedings of the 27th Meeting of International Society in Magnetic Resonance and Medicine. Montreal. Canada. 2019
- **Bednarik P**, Tkac I, Giove F, Deelchand D, Eberly L, Barreto F a Mangia S. Neurochemical and BOLD Responses in Activated Blob and Interblob Neuronal Populations Measured in the Human Visual Cortex at 7T (ISMRM 2015, Toronto). **ISMRM Merit Award: Magna cum laude.**
- **Bednarik P**, Henry PG, Kumar A, Eberly L, Seaquist E, Oz G, Moheet A. Hippocampal glucose transport kinetics in subjects with type 1 diabetes (T1D) and impaired awareness of hypoglycemia (IAH). (Meeting of American Diabetes Association, Boston 2015)
- **Bednarik P**, Tkac I, Giove F, Deelchand D, Mangia S. Correlations between BOLD and neurochemical responses measured in the human visual cortex at 7T (ISMRM 2014, Milan, Italy)
- **Bednařík P**, Svoboda T, Mareček R, Košťálová M, Mikl M, Brázdil M, Krupa P. Preoperative Functional MR Imaging in Patients with Brain Tumors. In 5th Meeting of the Central European Neurosurgical Society. 2008. ISSN 1608-1587

INVITED TALKS

- **Bednarik P.** Advanced Proton Magnetic Resonance Spectroscopy: Clinical and Basic Neuroscience Applications. The Center of Excellence for MR Research, University of Vienna. 2017.
- **Bednarik P.** Recent applications of functional spectroscopy in the human visual cortex, seminar at the Center for Magnetic Resonance Research, University of Minnesota. 2015
- **Bednarik P.** Clinical utility of fMRI. fMRI course. Brno 2010.

SELECTED CONFERENCE ABSTRACTS

- **Bednarik P.**, Horák T., Horáková M, Svátková A, Kadaňka Z, Kadaňka Z jr, Kudlička P, Valošek J, Deelchand D, Henry P-G, Bednařík J. Proton Magnetic Resonance Spectroscopy in Degenerative Cervical Spinal Cord Compression. ISMRM 2020.
- Svatkova, A.; Minarikova L.; **Bednarik, P.**; Rosenmayr, V., Hangel, G.; Strasser, B.; Hingerl, L.; Stulnig, T.; Gruber, S. Metabolic and microstructural MPSII brain alteration revealed by multiparametric MR imaging and spectroscopy – a combined 3T and 7T study, in ISMRM, 2020
- **Bednarik P**, Svatkova A, Mangia S, Lenglet C, Moran A, Moheet A. Diffusion tensor imaging (DTI) in patients with cystic fibrosis. ISMRM 2018.

- Kubisiak K, Fiecas M, **Bednarik P**, Svatkova A, Mangia S, Michaeli S, Carpenter A, Eberly L. Penalized Models to Detect Subtle Multiple Sclerosis Abnormalities in White and Grey Matter Using Functional Data Analysis of Multiple Non-Conventional MRI Contrasts In 2018 Spring Meetings of the International Biometric Society - Eastern North American Region, Atlanta, USA. 2018.
- Svatkova A, Mueller B, **Bednarik P**, Nguyen C, Vojtisek L, Mangia S, Nissi M, Michaeli S, Nestrasil I. Rotating Frame MRI Contrasts For Assessment of White Matter Alteration in Mucopolysaccharidosis Type I ISMRM 2018.
- Grohn H, Mascali D, **Bednarik P**, Moheet A, Kumar A, Eberly L, Seaquist E, Mangia S. The increase of whole-cortex blood flow during hypoglycemia is greater in patients with type 1 diabetes than in non-diabetic subjects, irrespective of the patient awareness of hypoglycemia. (Meeting of American Diabetes Association 2017)
- **Bednařík P**, Tkac I, Joers J, Svatkova A, Öz G, Deelchand D. Feasibility and Reproducibility of Neurochemical Profiling in the Human Hippocampus at 7T. ISMRM 2017.
- **Bednarik P**, Tkac I, Eberly L, Mangia S. The effect of sex on neurochemical profile quantified from the human brain at 7T. ISMRM 2017.
- **Bednarik P**, Tkac I, Deelchand D, Barreto F, Eberly L, Michaeli S, Mangia S. Functional MRS at 7T and long TE. ISMRM 2016.
- **Bednarik P**, Kubisiak K, Svatkova A, Eberly L, Moheet A, Kumar A, Michaeli S, Seaquist E, Mangia S. White matter alterations in type 1 diabetes (T1D) as revealed by T1w/T2w ratio. Meeting of the American Diabetes Association. New Orleans 2016.
- Mangia S, Svatkova A, **Bednarik P**, Nestrasil I, Eberly L, Carpenter A, Michaeli S. Rotating frame MRI in human subjects with Multiple Sclerosis. ISMRM 2016.
- Svatkova A, Pasternak O, Rudser K, **Bednarik P**, Mueller B, Wakumoto A, Shapiro E, Whitley Ch, Nestrasil I. Comprehensive white matter assessment in Mucopolysaccharidosis type I – a DTI study. 2016 OHBM, Geneva. 2016
- Barreto F, Evanoff N, Dengel D, **Bednarik P**, Tkac I, Salmon C, Mangia S. Metabolic changes in activated human visual cortex during mild hypoxia. ISMRM 2015. ISMRM merit award: Magna cum laude
- **Bednarik P**, Oz G, Eberly L, Kubisiak K, Mangia S, Kumar A, Lenglet C, Seaquist E, Moheet A. Subcortical and Hippocampal Volumes in Patients with Type 1 Diabetes (T1D) (At the meeting of the American Diabetes Association, 2015)
- Nestrasil I, **Bednarik P.**, Yund B, Delaney K., Kovac V., Ahmed A., Shapiro E. Brain MRI abnormalities in Mucopolysaccharidosis Type I: Cross-sectional Study (2014)
- **Bednarik P**, Moheet A, Deelchand D, Emir U, Seaquist E, Oz G. Feasibility and reproducibility of neurochemical profile quantification in the human hippocampus at 3T (ISMRM 2014)
- **Bednarik P**, Khowaja A, Kumar A, Eberly L, Seaquist E, Oz G, Moheet A. Hippocampal Neurochemical Profile of Subjects with Type 1 Diabetes (T1D) as Measured by ¹H - Magnetic Resonance Spectroscopy (MRS) (At the meeting of the American Diabetes Association, 2014)
- **Bednarik P**, Tkac I, Grant A, Emir U, Deelchand D, Mangia S. Human studies of functional MRS at 7T with semi-LASER (ISMRM 2013)
- Keřkovský M, Kašpárek T, **Bednařík P** et al. White matter abnormalities of the motor network in schizophrenia. ECR 2011. Vienna.
- **Bednařík P**, Mareček R, Mikl M et al. Preoperative functional MR imaging in patients with brain tumors and epilepsy. 10/2010, ICCN 2010, Kobe, Japan.
- **Bednařík P**, Brázdil M, Mikl M, Mareček R, Košťálová M, Svoboda T, Chlebus P, Krupa, P. Preoperative fMRI mapping of eloquent cortical areas. In 55th meeting of Czech and Slovak Society for Neurophysiology. 2008. ISBN 978-80-7392-060-9.
- **Bednařík P**, Svoboda A, Mareček R, Košťálová M, Mikl M, Krupa P. Comparison of peroperative cortical stimulation and preoperative fMRI. Cesk Slov Neurol N 2007 (Suppl): 40.

GRANTS

Completed research projects:

- Glutamate dynamics during visual stimulation and ketamine challenge in the human brain, 186 000 €, H2020, Marie Skłodowska-Curie Individual Fellowship, evaluation 97 %, 2019-2021
- Glutamate Dynamics During Ketamine Challenge in the Human Brain, 70 000 \$ 2018 NARSAD Young Investigator Grant, Brain and Behaviour Research Foundation, New York, USA, 01/2019-01/2022.
Role:PI
- Advanced magnetic resonance techniques to disclose pathophysiology and improve diagnosis and clinical management of degenerative cervical cord compression 600 000 € Ministry of Health of the Czech Republic Research Programme
Role:Co-investigator
- Preliminary MRS measurements from the human hippocampus at 7T PARS #10284, CMRR, University of Minnesota, funded from NIH center grant 09/23/15-08/26/16, 11250 \$
Role: PI
- Identifying the Brain Substrates of Hypoglycemia Unawareness in Type 1 Diabetes NIH R01, PI Silvia Mangia
Role: Postdoc
- Mechanisms of Non-Invasive Neuromodulation Interventions
Role: Co-Investigator
- Functional MRS at 7T to study neuronal inhibition in human NIH R03NS082541
Role: Research Assistant
- Effects of intensive dancing therapeutic intervention on cognitive functions and changes of the brain plasticity in healthy seniors and patients with mild cognitive impairment Ministry of Health of the CR / Ministry of Health Research Programme 2015 - 2018
Role: Co-Investigator
- Probing Oxidative Stress and Neuroinflammation as Potential Therapeutic Targets in MPS I, 45000 \$ MPS Society, 10/1/17 - 9/30/18
Role: Co-Investigator

SKILLS

- Diagnostic and interventional radiology (X-ray skiagraphy and fluoroscopy, ultrasound, CT, MRI, vascular interventional radiology and neuroradiology)
- MRS and MRI data acquisition at 3T and 7T human Siemens scanners
- Designing and optimization of multimodal MRI/MRS/TMS acquisition protocols
- Functional MRI and Functional Spectroscopy
- Advanced MRI and MRS data analysis
- Linux scripting and Matlab programming
- Visual stimulation programming - Psychtoolbox
- Brain segmentation and volumetry
- FSL, Freesurfer, SPM, Human Connectome Project pipeline
- Neuroimaging in diabetes, epilepsy, multiple sclerosis, neurodegenerative diseases, and in rare disorders (e.g., mucopolysaccharidosis), MRI/MRS of the human spine
- Manuscript preparation, grant writing

HONORS

- Czech Radiological Society Award for the best paper 2014-2016
- ISMRM MERIT AWARD: Magna cum laude, ISMRM 2015 Toronto (awarded peer-reviewed talk)
- ISMRM MERIT AWARD: Summa cum laude, ISMRM 2020 (awarded peer-reviewed talk)
- CMRR Spectroscopy workshop 2021:Poster award

REVIEWER

Neuroimage, NMR Biomedicine, Brain Structure and Function, PLoS ONE, Journal of Neuroscience Research, Czech and Slovak Neurology and Neurosurgery

COLLABORATIVE NETWORK

CMRR – Prof. Mangia & Dr. Tkac – functional spectroscopy

CMRR – Prof. Gulin Oz & Dr. Dinesh Deelchand – single voxel MRS methodology

CMRR – Dr. Christophe Lenglet – MRI

CMRR – Prof. Pierre Gilles Henry – Metabolic modelling, MRS of the spine

CMRR – Prof. Seaquist, Dr. Moheet - Diabetes

MUW – Prof. Bogner – MRSI

MUW - Prof. Lanzenberger – multimodal imaging in neuropsychiatry

LDN network – Dr. Nestrasil