

**Název oboru:** Neurovědy (čtyřleté), doktorské studium, forma: doktorské prezenční

**Název kliniky:** 1. neurologická klinika, Lékařská fakulta, Masarykova univerzita

**Téma disertace:** Self-control to face life adversity and maladaptive reward-related behaviours

**Anotace:** Human inability to resist temptations and to control oneself underlies several clinical disorders including impulse and reward-related behaviours. The main aim of the proposed project is to understand the impact of early life adversity on self-regulation and reward-related behaviours and to identify protective factors that might protect the individual from developmental disruptions following early exposure to adversity. We hypothesize that (1) early life adversity might modulate the development of corticostriatal and corticolimbic circuitry and increase the risk for maladaptive reward-related behavior in young adulthood, and that (2) preventive intervention focused on self-control and regulation of stress might protect high-risk adolescents. The PhD student will be part of the Behavioral and Social Neuroscience research group at CEITEC MU.

**Počet přijímaných uchazečů:** 1

**Napojení na grantový projekt:** Téma disertační práce navazuje na podaný mezinárodní Gender-NET grant *Preterm birth as a moderator of sex-specific psychiatric risk and symptoms: Developing a tailored preventive intervention*.

**Úvazek nebo projektové financování PGS místa nad rámec stipendia:** zatím není k dispozici, plánováno je zapojení doktoranda do odevzdaného Gender-NET projektu.

**Požadavky na studenta:**

Ukončené magisterské vzdělání v oborech psychologie, kognitivní informatika, aplikovaná informatika

Složení přijímací zkoušky včetně části pohovoru v angličtině

Znalost anglického jazyka minimálně na úrovni B2 dle Společného evropského referenčního rámce

Publikační aktivita výhodou

Připravenost účastnit se mezinárodní spolupráce

Výhodou jsou osobní zkušenosti programováním a vývojem software

**Školitel: Klára Marečková, Ph.D.**

- Publikační aktivita školitele: 12 publikací (z toho 10 prvoautorských), dle Web of Science: h-index 4, průměrný počet citací na článek 9

- Řešené grantové projekty:

- Marie Curie Intra-European Fellowship (FP7-IEF-2013) *Biomarkers and underlying mechanisms of vulnerability to depression*
- Mezinárodní (CZ-US) projekt *Sleep deprivation and structural fluctuations in white matter*
- GAMU – Mezioborový výzkumný projekt *Economic decision making: Hormonal determinants and ritualized behavior*

- Mezinárodní spolupráce: University of Toronto, Harvard Medical School

- Počet PhD studentů: 1

## **Klára Marečková, Ph.D., MSc.**

Brain and Mind Research Programme  
CEITEC, Masaryk University  
5 Kamenice, Brno, 625 00, Czech Republic

Phone: +420 776 339 544  
Email: klara.mareckova@gmail.com

### **Education**

- 2010 – 2013 PhD in Psychology, University of Nottingham  
Thesis: Sex differences and the role of sex hormones in face development and face processing.  
Supervisors: Tomáš Paus, M.D., Ph.D., Dr. Claire Lawrence, Ph.D.
- 2008 – 2009 MSc in Cognitive Neuroscience and Neuroimaging, University of Nottingham  
Thesis: Neural correlates of body-image perception in adolescence.  
Supervisor: Tomáš Paus, M.D., Ph.D.

### **Work Experience**

- 2017 – present Postdoctoral fellow at Centre for Addiction and Mental Health, Toronto (CA)
- 2017 – present Postdoctoral fellow at CEITEC, Masaryk University (CZ)
- 2015 – 2017 Marie Curie Fellow (FP7-IEF-2013) at CEITEC, Masaryk University (CZ)
- 2015 – 2017 Collaborator at Brigham and Women's Hospital and Massachusetts General Hospital, Harvard Medical School (US)
- 2015 – 2016 Local coordinator of the international project Sleep deprivation and structural fluctuations in white matter (Child Mind Institute, New York – CEITEC, MU).
- 2014 Visiting postdoc at Brigham and Women's Hospital, Harvard Medical School (US)
- 2013 – 2015 Postdoctoral fellow at CEITEC, Masaryk University (CZ)
- 2010 – 2013 Visiting PhD student at Rotman Research Institute at Baycrest (CA)
- 2008 – 2009 Research assistant for EC FP6 project IMAGEN, University of Nottingham (UK)

### **Papers**

- Mareckova et al. (2018). Perinatal stress and human hippocampal volume: Findings from typically developing developing young adults, *Scientific Reports*, 8, doi:10.1038/s41598-018-23046-6
- Mareckova et al. (2018). Prenatal stress, mood and gray matter volume in young adulthood, *Cerebral Cortex*, doi:10.1093/cercor/bhy030.
- Mareckova et al. (2017). Neural and hormonal responses to negative affective stimuli: Impact of dysphoric mood and sex, *Journal of Affective Disorders*, 222, 88-97.
- Mareckova et al. (2016). Brain activity and connectivity in response to negative affective stimuli: Impact of dysphoric mood and sex across diagnoses, *Human Brain Mapping*, 37(11), 3733-3744.
- Mareckova et al. (2015). Identifying craniofacial features associated with prenatal exposure to androgens and testing their relationship with brain development. *Brain Structure and Function*, 220(6), 3233-3244.
- Mareckova et al. (2014). Hormonal contraceptives, menstrual cycle and brain response to faces. *Social Cognitive and Affective Neuroscience*, 9(2), 191-200.
- Mareckova et al. (2013). Does skull shape mediate the relationship between objective features and subjective impressions about the face? *Neuroimage*, 79, 234-240.
- Tahmasebi et al. (2012). Creating probabilistic maps of the face network in the adolescent brain: a multi-centre functional MRI study. *Human Brain Mapping*, 33, 938-957.
- Mareckova et al. (2011). Testosterone-mediated sex differences in the face shape during adolescence: Subjective impressions and objective features. *Hormones and Behavior*, 60(5), 681-690.

### **Abstracts**

- Mareckova et al. *Prenatal stress predicts mood and gray matter volume in young adulthood*, Organization for Human Brain Mapping, Vancouver, Canada, 2017.

- Mareckova et al. (2015). Neural and Hormonal Responses to Negative Affective Stimuli” Impact of Sex and Depressed Mood, *Neuropsychopharmacology*, 40, S176-S177. (IF 7.05)
- Garcia et al. (2015). Central Modulation of Parasympathetic Response to Negative Affect is Disrupted in Major Depression: Impact of Sex, *Neuropsychopharmacology*, 40, S157-S158. (IF 7.05)
- Mareckova et al. (2015). Mood dysregulation, sex and sex hormones predict stress response circuitry deficits, *Clinical Neurophysiology*, 127 (3), e113. (IF 3.36).
- Mareckova et al. (2014). Mood dysregulation and stress response circuitry deficits: Impact of diagnosis, mood state and sex, *Neuropsychopharmacology* 39, S201-S202. (IF 7.05)
- Goldstein et al. *Prenatal immune programming of adult stress response circuitry deficits across disorders (psychoses and mood) and sex*, Annual Meeting of American College of Neuropsychopharmacology, Phoenix, AZ, US, 2014.
- Mareckova et al. (2014). *Neural circuitry associated with mood dysregulation in response to stress: shared across psychiatric diagnosis and differs by sex*. In Abstracts Fourth Biennial Conference on Resting State Brain Connectivity September 11–13, 2014 Boston/Cambridge, Massachusetts, USA, *Brain Connectivity*, 4(9): A1-A158.
- Mareckova et al. *Recognition of Facial Emotions in Adolescence*, Cognitive Neuroscience Society meeting, Boston, MA, US, 2014.
- Mareckova et al. *Female sex hormones and BOLD response to faces*, Organization for Human Brain Mapping (OHBM), Quebec City, Canada, 2011.
- Tahmasebi et al. *Functional Connectivity in the Face Network during Adolescence: Sex Difference and Sex-Steroid Genes*, Organization for Human Brain Mapping (OHBM), Quebec City, Canada, 2011.
- Dickie et al. *Personality of male adolescents predicts functional connectivity while viewing social stimuli*, Organization for Human Brain Mapping (OHBM), Quebec City, Canada, 2011.

### **Talks**

- Sex differences and the role of sex hormones in face development and face processing, Brigham and Women’s Hospital, Harvard Medical School, Boston, US, July 2013.
- Prenatal immune programming of sex differences in stress circuitry function and vulnerability to depression and psychosis, St. Anne Hospital, Neurology Clinic, Brno, CZ, February 2015.
- Mood dysregulation, sex, and sex hormones predict stress response circuitry deficits, Olomouc fMRI Workshop, Olomouc, CZ, April 2015.
- Biomarkers and underlying mechanisms of vulnerability to depression, Sick Kids hospital, Toronto, CA, March 2016.
- White matter integrity studies using DWI, Workshop on Innovations in mapping of brain function and structure, CEITEC Neuroimaging Workshop, Brno, CZ, April 2016.
- Neural and Hormonal Responses to Negative Affective Stimuli: Impact of Dysphoric Mood and Sex across Diagnoses, Martinos Centre for Biomedical Imaging, Boston, MA, May 2017.
- Biomarkers and underlying mechanisms of vulnerability to depression, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, June 2017.
- Stress and its impact on brain structure and function, Centre for Addiction and Mental Health, Toronto, December 2017.

### **Grants and funding**

- GAMU Interdisciplinary Research Project *Economic decision making: Hormonal determinants and ritualized behavior* (4 998 281 CZK)
- Child Mind Institute (USA) and MSMT (CEITEC, CR) funding to conduct study on *Sleep deprivation and structural fluctuations in white matter* (total of 62 000 USD)
- FP7-PEOPLE-2013-IEF, *Biomarkers and underlying mechanisms of vulnerability to depression* (total score 95.2 / 100; total of 146 000 EUR)
- BMBF funding to participate at the 65<sup>th</sup> Lindau Nobel Laureate Meeting, Germany, 2015.

NIH funding to participate at NITP Advanced Neuroimaging Summer Program at UCLA, USA, 2013.

**Reviewer for peer reviewed journals:** Neuroimage, Psychoneuroendocrinology, Brain Research, Brain Structure and Function, Human Brain Mapping, Journal of Neuroscience Research

**Reviewer for conference abstracts:** OHBM 2015, OHBM 2016

**Reviewer for European grant proposals:** MSCA-IF-2016, MSCA-IF-2017