

## **Project:** Cognitive control in depressive disorders

**Cooperation partners:** County Hospital Hall in Tirol, Department of Psychiatry and Psychotherapy (J. Marksteiner, A. Bair); University of Bonn, Germany (U. Ettinger); University of Jaén, Spain (G.A. Reyes del Paso)

Depressive disorders severely affect patients' psychosocial function and quality of life, and impose a significant socio-economic burden. The lifetime prevalence of these disorders is estimated at 20%, with approximately two thirds of patients experiencing recurrent episodes or a chronic course. The impact of depressive disorders on public health is immense; the WHO recognizes them as the major cause of disability worldwide.

This project is concerned with the role of cognitive control in the pathogenesis of depressive disorders. Cognitive control refers to top-down regulation, coordination, and sequencing of basic mental operations. Deficits in cognitive control are relevant to dysfunctional cognitive schemes, repetitive thinking (rumination, worry) and emotional dysregulations, which in turn are crucial to the genesis of depression symptoms. The project aims to analyze these deficits, and their central nervous and peripheral physiological correlates (cortical activity, autonomic regulation). In addition to methods taken from experimental psychology, psychophysiological techniques (functional transcranial Doppler sonography, electrocardiography and impedance cardiography) are applied.

Numerous students of UMIT Tirol are involved in the project within the context of their bachelor and master theses; moreover, the project encompassed the PhD of A. Bair. The collaboration between UMIT TIROL and University of Jaén is supported by an ERASMUS+ agreement. To further analyze central nervous correlates of cognitive control using EEG (evoked potentials) and neuroimaging (fMRI), a grant has been applied for (in collaboration with the University of Bonn, U. Ettinger) from the German Research Foundation (DFG) and Austrian Science Fund (FWF) (DACH Lead Agency Procedure, project title: Neural Correlates of Proactive Control in Major Depressive Disorder).

### **Previous publications from the project**

Bair, A., Marksteiner, J., Stöcklein, T. Reyes del Paso, G.A. & Duschek, S. (2022). Parasympathetic Cardiac Control during Attentional Focus and Worry in Major Depressive Disorder. *International Journal of Psychophysiology*, in press. doi: 10.1016/j.ijpsycho.2022.04.008

Bair, A., Marksteiner, J., Falch, R., Ettinger, U., Reyes del Paso, G.A. & Duschek, S. (2021). Features of Autonomic Cardiovascular Control during Cognition in Major Depressive Disorder. *Psychophysiology*, 58, e13628. doi: 10.1111/psyp.13628

Bair, A., Reyes del Paso, G.A., & Duschek, S. (2021). Parasympathetic Cardiac Control and Attentional Focus in Habitual Worry. *International Journal of Psychophysiology*, 162, 181-189. doi: 10.1016/j.ijpsycho.2020.05.002

Duschek, S., Hoffmann, A., Reyes del Paso, G.A., & Montoro, C.I. (2021). Short-term Cerebral Blood Flow Variability in Major Depressive Disorder. *Journal of Affective Disorders*, 282, 1120-1124. doi: 10.1016/j.jad.2020.12.136

Hoffmann, A., Ettinger, U., Montoro, C., Reyes del Paso, G.A., & Duschek, S. (2019). Cerebral Blood Flow Responses during Prosaccade and Antisaccade Preparation in Major Depression. *European Archives of Psychiatry*, 269, 813-822. doi: 10.1007/s00406-018-0956-5

Hoffmann, A., Montoro, C.I., Reyes del Paso, G.A., & Duschek, S. (2018). Cerebral blood flow modulations during cognitive control in major depression. *Journal of Affective Disorders*, 237, 118-125. doi: 10.1016/j.jad.2018.05.011

Hoffmann, A., Montoro, C.I., Reyes del Paso, G.A., & Duschek, S. (2018). Cerebral blood flow modulations during proactive control in major depressive disorder. *International Journal of Psychophysiology*, 133:175-181. doi: 10.1016/j.ijpsycho.2018.07.003

Hoffmann, A., Ettinger, U., Reyes del Paso, G.A. & Duschek, S. (2017). Executive function and cardiac autonomic regulation in depressive disorders. *Brain and Cognition*, 118, 108-117. doi: 10.1016/j.bandc.2017.08.003