

5.5.2 Interdisciplinary Centre for Addiction Research (ICAW)

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General Information

ICAW has developed in 2000 from the interdisciplinary BMBF addiction research network (1996-2001) focusing on neurobiological and behavioral foundations of alcohol-addiction. The objectives are enduring development and encouragement of clinical and neurobiological research on substance related and non substance related addiction. Advancement of traineeship, teaching, qualification in addiction associated topics, inpatient and outpatient interventions and political decision guidance are additional topics. Due to the success of the first IZSW research workshop, repetition is planned annually.

Major Research Interests

Biopsychological mechanisms of nicotine craving

(P. Pauli, R. Mucha, M. Winkler, L. Wu, Department of Psychology)

Generally, smoking associated stimuli are considered to act as strong incentives in dependent smokers, thereby motivating excessive consumption. In two projects we use biopsychological methods (startle-Modulation, EMG, EDA, EEG, fMRI) to examine the motivational basis of addiction specific learning processes (FOR 605) and the capacity of smokers to self-regulate their emotions (GRK 1253/1). In particular, we are interested in the precise mechanisms underlying the reactivity of smoking cues and stimuli from the terminal stage of the smoking ritual. Furthermore, we examine the impact of different appraisal strategies on the neural processing of affective and smoking related stimuli.

ADHD as a risk factor for the development of addiction

(C. Jacob, KP Lesch Dept. of Psychiatry, Psychosomatics and Psychotherapy, Molecular Psychiatry)

Comorbid drug developments are often the result of a failed "self-treatment trial." On the other hand, the treatment of ADHD with stimulants is protective against substance use disorders. Neurobiological and psychological processes such as reward-related behavior, cognitive-executive dysfunction, stress coping or anxiety that are involved in the development of alcohol addiction are presumably under the influence of genetic

variation. Traits, e.g. impulsivity or emotional lability are directly or indirectly related to morbidity.

Addiction and Mental Disorders

(J. Deckert, Dept. of Psychiatry, Psychosomatics and Psychotherapy)

The relevance of substance and non substance related addiction other than alcohol (caffeine, nicotine, amphetamine and cannabis) and its neurobiology for the pathogenesis and therapy of mental disorders has developed as an additional research topic, partly within the context of the SFB-TRR58 on "Fear, Anxiety and Anxiety Disorders". It focuses on the modulation of mental disorders by substance abuse-related genetic factors and the consequences of substance abuse for the therapy of mental disorders employing drug monitoring as well as genetic and imaging techniques.

Substance and behavioural addiction: executive function and learning

(Kübler, A. Meule, Y. Paelecke-Habermann, Dept. of Psychology I)

Parallels between substance dependence and excessive ('addictive') eating can be found in behaviour and cardiac-autonomic regulation. Further overlapping cognitive, behavioral, and physiological aspects are investigated.

We found deficits in reward learning from positive reinforcers in smokers and alcoholics. We are currently investigating whether such deficits can be shown in social drinkers, women with compensatory buying behaviour and women with aberrant eating behaviour.

Chromosomal effects of stimulants and stress in adult ADHD patients

(C. Jacob, S. Kittel-Schneider, S. Spiegel, T. Renner, A. Reif, H. Stopper)

The effect of the long-term administration of MPH on chromosomal integrity has not yet been investigated in adult ADHD patients. Besides various toxic environmental factors, aversive experienced stress is an essential risk factor for the development of physical illness and probably also chromosomal damage. One aim of the study is to investigate the long-term effects of MPH on the chromosomes. Contrary to prior studies, we hypothesize that the application of MPH reduces the psychological distress lo-

wering the number of micronuclei frequencies compared to untreated AADHD probands.

Teaching

The seminar “neurobiology of addiction“is an advanced training for young scientists and students of medicine, psychology and biology. The annual basic and advanced training workshop of addiction medicine is an additional teaching activity. Research projects are presented on the annual meetings of the ICAW.

SELECTED PUBLICATIONS

Bodenmann S, Hohoff C, Freitag C, Deckert J, Rétey JV, Bachmann V, Landolt HP (2012) Polymorphisms of ADORA2A modulate psychomotor vigilance and the effects of caffeine on neurobehavioral performance and sleep EEG after sleep deprivation. *Br J Pharmacol.* 165:1904-13.

Jacob C, Nguyen TT, Dempfle A, Heine M, Windemuth-Kieselbach C, Baumann K, Jacob F, Prechtl J, Wittlich A, Herrmann MJ, Gross-Lesch S, Lesch KP, Reif A. (2010) A gene-environment investigation on personality traits in two independent clinical sets of adult patients with personality disorder and attention deficit/hyperactivity disorder. *Eur Arch Psychiatry Clin Neurosci.* 260:317-26.

Meule, A., Vögele, C., & Kübler, A. Deutsche Übersetzung und Validierung der Yale Food Addiction Scale [German translation and validation of the Yale Food Addiction Scale]. *Diagnostica*, 58, xx-xx. in Druck).

Walitza S, Kämpf K, Artamonov N, Romanos M, Gnana Oli R, Wirth S, Warnke A, Gerlach M, Stopper H. (2009) No elevated genomic damage in children and adolescents with attention deficit/hyperactivity disorder after methylphenidate therapy *Toxicol Lett.* 184:38-43.

Winkler, M. H., Weyers, P., Mucha, R. F., Stippekohl, B., Stark, R., Pauli, P. (2011). Conditioned cues for smoking elicit preparatory responses in healthy smokers. *Psychopharmacology*, 213:781-789.