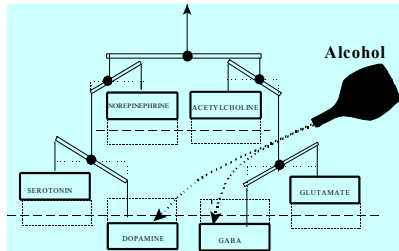


Systems Neuropsychiatry of Stress, Anxiety and Addiction - an integrated view -

May, Fri 03 / Sat 04, 2013

9th International Workshop on
Computational Neuropsychiatry



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Supported by:



Preamble

Today, neuropsychiatry is facing the challenge to 'understand' an overwhelming amount of data. It is assumed that empirical findings can 'explain' clinical phenomena and lead the development to new therapeutic tools. However, 'complexity' and 'dynamics' of the brain are the methodological key challenges for current theories in neurobiology which need new approaches for understanding. We think this approach could be based on *systems methodology*. Systems methodology can be characterised by a multi-level approach, by mathematical tools of complexity reduction and formal and computational modelling, aiming at computer-based in-silico experimentation. The systems approach is closely related to in-vivo and in-vitro experimentation developing its ideas in an interactive way. In this field systems scientists, experimental neurobiologists and clinicians work together in order to improve the understanding of mental disorders on a biological basis.

In this context, in our 9th symposium on 'Systems Neuropsychiatry', we will discuss integrative concepts of 'Stress, Anxiety and Addiction'. Here, we would like to present integrated functional knowledge of circuits of stress and anxiety (McEwen, Panksepp) which are interconnected with circuits of addiction (Volkow). Risk factors for addiction like 'impulsivity' (Everitt) are key factors to be discussed from an interdisciplinary perspective. Concepts like 'regulation', 'dysbalance', 'adaptation' (Allostasis; Koob & LeMoal) are crucial in this macro-structural context. Regarding the biochemical level, the dopaminergic transmission system is essential for acquiring addictive dispositions by reward mechanisms, but it is not the whole story: reward itself is a complex process (Berridge) and should be related to the opposing process of punishment, for instance the serotonergic transmission system (Dayan). Also, the nonlinear dynamics of synaptic dopaminergic computation have to be discussed with the aid of computational models (Voit).

One special role is played by the endocannabinoid system, which is mainly inhibiting the electrical reactivity of the respective neuron and even has retrograde presynaptic signalling properties. Additionally, the intracellular molecular signalling network, connected to dopamine signalling pathways, is analysed by exploratory computational models. Finally, the interplay between the genome, the proteome, the transcriptome and the epigenome (Nestler) is being explored.

The symposium aims to find a better understanding of the pathways from stress and anxiety to addiction, as one of the most important public health issues.

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Registration (no registration fee):

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Walter E. MÜLLER

Department of Pharmacology, University of Frankfurt

PROGRAMME

(45 min = 30 min talk, 15 min discussion;
30 min = 20 min talk, 10 min discussion)

----- Friday, May 03, 2013 -----

13.00 Welcome

INTRODUCTION

Oliver POGARELL / Felix TRETTER / Margot ALBUS / Dan RUJESCU / Chris TURCK / Werner MEWES / Eva MEISENZ AHL

CLINICAL ASPECTS

13.15 Moderation: John DITTAMI (Behavioural Biology, Univ. of Vienna, A)

Felix TRETTER (Dept. of Addiction, IAK-KMO, Munich, G)

Perspectives of systems neuropsychiatry of stress, anxiety and addiction

14.00 Moderation: Andreas DRAGUHN (Physiology, Univ. of Heidelberg, G)

Andreas J. FALLGATTER (Dept. of Psychiatry, Univ. of Tübingen, G)

The Neurobiology of stress and anxiety

14.45 Break

15.00 Moderation: Ulrich MANSMANN (Bioinformatics, Univ. of Munich, G)

Ulrich ZIMMERMANN (Dept. of Psychiatry, Univ. of Dresden, G)

Neurobiology of stress and addiction

15.45 Moderation: Eva MEISENZ AHL (Psychiatry, Univ. of Munich, G)

Boris TABAKOFF (Dept. of Pharmacology, Univ. of Colorado, Denver, USA)

Molecular neurobiology of alcoholism and new treatment options

16.30 Break

17.00 Moderation: Oliver POGARELL (Dept. of Psychiatry, Univ. of Munich, G)

Barry EVERITT (Downing College Cambridge, UK)

Vulnerability: neural circuits and switches from impulsivity to compulsivity

17.45 Moderation: Dan RUJESCU (Dept. of Psychiatry Univ. of Halle, G)

Philippe DE WITTE (Univ. of Louvain, B)

Imbalance between neuroexcitatory and -inhibitory amino acids causes craving for nicotine and ethanol

KEYNOTE LECTURE

18.30 Moderation: Matthias MUNK (MPI Biol. Cybernetics, Tübingen, G)

Viktor JIRSA (Univ. of Marseille, F)

The Human Connectome Project

19.15 Invited Discussant: Hans-Werner MEWES

20.00 End

20.30 Dinner

----- Saturday, May 04, 2013 -----

BASIC RESEARCH

09.00 Moderation: Hans BRAUN (Physiology, Univ. of Marburg, G)

Rafael MALDONADO (Neuropharmacology, Univ. of Pompeu Fabra, Barcelona, E)

Information processing in the endocannabinoid system

9.45 Moderation: Michael ZEHETLEITNER (Psychology, Univ. of Munich, G)

Chris TURCK (MPI for Psychiatry, Munich, G)

Anxiety biosignatures

10.15 Moderation: Stephan SELLMAIER (Neurophilosophy, Univ. of Munich, G)

Maurizio POPOLI (Neuropharmacology, Univ. of Milan, I)

Epigenetic regulation in the stress response and vulnerability for neuropsychiatric disorders

10.45 Break

11.15 Moderation: Uwe AN DER HEIDEN (Chair of Mathematics, Witten-Herdecke, G)

Francois IRIS (bmsystems, Paris, F)

Molecular pathways of anxiety

11.45 Moderation: Peter GEBICKE-HAERTER (Mannheim, G and Chile)

Eberhard VOIT & Zen QUI (Georgia Institute of Technology, Georgia, USA)

Molecular biological mechanisms of addiction

12.15 Moderation: Gustavo DECO (Univ. of Barcelona, E)

Boris GUTKIN (École Normale Supérieure, Paris, F)

Computational model of mechanisms of addictions

13.00 FINAL DISCUSSION

Moderation: Oliver POGARELL / Dan RUJESCU / Felix TRETTER

13.30 END OF WORKSHOP