

Medical Science / Neuroscience
Planning Group Members: Joachim Gross and Hidemi Watanabe

Molecular Basis of Human Mind and Mental Disorders

Speaker:

Alexander Strobel, University of Technology Dresden

Molecular genetic influences on personality and psychopathology

The neurotransmitter serotonin has long been implicated in the development of anxiety disorders and depression. Serotonin has also been assumed to play an important role in the modulation of personality dimensions which can be summarized under the label, 'negative emotionality' and which are major vulnerability factors for the development of psychiatric disorders. With the advent of molecular genetic techniques, it has become possible to further elucidate the role of serotonin in the modulation of personality even in healthy humans which cannot easily be treated with substances influencing serotonin function. The existence of genetic variations throughout the genome which often result in altered brain function has offered the opportunity to examine the impact of such genetic polymorphisms on self-reported behavioral tendencies as well as on brain processes proposed to underlie overt behavior. To illustrate the progress in this field, current evidence on the association between negative emotionality and genetic variation of serotonin function will be reviewed. In addition, recent insights from genomic imaging studies will be summarized which show that this genetic variation influences neuronal processing of fearful and threatening events. Finally, emerging evidence will be presented which suggests that genetic polymorphisms commonly referred to as risk factors may under some circumstances have advantageous effects and that it is rather the interplay between genetic variation and environmental factors which determines an individual's level of negative emotionality or its risk to develop psychiatric disorders.

Suggested reading: Hariri, A.R. & Weinberger, D.R. (2003). Functional neuroimaging of genetic variation in serotonergic neurotransmission. *Genes, Brain and Behavior*, 2, 341-349.