



Prof. Dr. Richard Ebstein (National University of Singapore)

The emerging molecular genetic architecture of human social life

Donnerstag 09.06.2011, 18 c.t. – 20 Uhr

Konferenzraum - Lehrstuhl für Biologische und Differentielle Psychologie,
Stefan-Meier-Str. 8, 3. OG

ABSTRACT

Much of what is known about the genetics of human social life converges on the role of two nonpeptides, oxytocin (OT) and vasopressin (AVP), in fine-tuning the contours of the social brain from voles to humans. The talk today will discuss the genetics of OT and AVP synaptic transmission including the polymorphic receptor genes (OXTR and AVPR1a), neurophysin I and II, oxytocinase and a new signaling molecule (CD38/ ADP-riboyl cyclase) that mediates brain OT release. Molecular genetic studies of these synaptic elements have focused not only on clinical syndromes, especially autism spectrum disorders (ASD) that are characterized by deficits in social skills and communication, but also on normal behaviors. Specifically, a number of investigations have shown association between the arginine vasopressin 1a receptor gene (AVPR1a) promoter-region repeats regions and ASD. The oxytocin receptor (OXTR) gene has also been linked to ASD. More recently, CD38 – a mediator of brain OT release, has been associated with ASD. Intriguingly, we have shown reduced expression of CD38 in lymphoblastoid cells (LBC) derived from ASD subjects. Furthermore, CD38 expression in LBCs is correlated with subjects' social skills and IQ. Finally, we have demonstrated that reduced transcription of CD38 in ASD-derived LBCs can be 'rescued' by treatment with all-trans retinoic acid (ATRA) suggesting a novel therapeutic window in this disorder. In the second half of the talk we will discuss some recent experiments employing behavioral economic paradigms that use an incentivized design viz. 'put your money where your mouth is', to test individual differences in prosocial and altruistic behaviors. Our own group carried out the first such study, using a molecular genetic approach combined with a classic behavioral economic paradigm the Dictator game (DG) to examine social decision-making. We have recently extended this first study to early childhood using a modified version of the DG adapted for 4 year olds. Altogether, these more recent human studies suggest that OT and AVP neurotransmission are salient elements in human social cognition and that dysfunctions in these pathways likely contribute to a spectrum of psychopathologies. A genetic approach is proving itself as a key component in the toolbox of neuroscience towards unraveling the complexity of the human social brain.

Brief BIOSKECH

Professor Richard P. Ebstein

Prof. Richard Ebstein received his MS and PhD degrees in the United States at Yale University and his post-doctoral training in Neurochemistry with Prof. Menek Goldstein at NYU Medical Center. He is a Professor Emeritus in the Psychology Department at the Hebrew University (Jerusalem) and for the past year is a Professor in the Psychology Department at the National University of Singapore. In Singapore, Prof. Ebstein along with Prof. CHEW Soo Hong (Economics) are jointly heading a group of researchers including economists, psychologists, neuroscientists and molecular geneticists investigating core issues in the nascent field of Neuroeconomics. Ebstein has made substantial contributions to the molecular genetics of human personality and is a pioneer in applying neurogenetic strategies towards understanding individual and social decision making. He has published ~260 peer reviewed articles (PubMed)