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Symposium FA-1  
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## **Cortical, Subcortical and Subcortico-Cortical Contributions to Human Social Aggression**

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Antisocial behavior is a plague for individuals and society. It is most frequently observed as impulsive-reactive aggression in antisocial personality disorder (ASPD) and presents a major challenge to social and clinical neuroscience. Much insight into the psychobiological mechanisms of impulsive social aggression has been achieved, but it largely originates from rodent research. Generalization to the human case can be problematic, because overt physical aggression in rodent social systems is an adaptation that not only curtails misbehaviors but also establishes dominance-submissive relationships. In higher primates, the socially aggressive interaction has evolved into a ritualized challenge based on gestures and displays wherein the social hierarchy is predominantly established non-aggressively. Facial expressions in particular hold pivotal signaling properties that can modify and control the behavior of individuals and social groups. The explorations of the neural systems of human behaviour do however not often reach the level of specificity and causality seen animal neuroscience.

In an attempt to bridge part of this gap, or at least to gather strong evidence, we recently performed several placebo-controlled testosterone administration repetitive and transcranial magnetic stimulation (rTMS) studies to get direct insights into the role of endocrine system and the prefrontal cortex in anger and aggression. At the symposium, phenomenological, behavioral and physiological data from both manipulations will be presented. Based on these data a neurobiological triple balance model of human aggression is proposed wherein aggression is defined in terms of imbalanced processing in /or miscommunication between/ the cortical, subcortical and subcortico-cortical levels of the brain.

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