

PL02-01 - NEUROBIOLOGY OF REWARD SYSTEMS: RELEVANCE FOR LEARNING, ADDICTION AND PSYCHOSIS

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Neurotransmitter systems such as dopamine and glutamate play a major role in encoding prediction errors and in learning of cue-triggered and goal-directed behaviour. Dysfunction of these neurotransmitter systems affect prefrontal-limbic neurocircuits and thus contribute to the formation of delusions, and to motivational and affective deficits. For example, reduced activation of the ventral striatum during reward anticipation has been associated with craving for drugs of abuse and with motivational deficits such as apathy, a so-called negative symptom in schizophrenia. Dopamine-dependent learning dysfunctions in alcohol dependence impairs learning of alternative, non substance-associated behaviour. On the other hand, aberrant activation during feedback of negative outcomes correlated with delusion formation in schizophrenic psychoses. Multimodal imaging studies implied glutamatergic and dopaminergic dysfunction to be associated with altered functional brain activation. Human genetic and imaging studies revealed that candidate genes, which affect monoamine metabolism, interact with neurotransmission and task-relevant activation in these brain areas; furthermore, first and second-generation neuroleptics differentially interact with functional brain activation in these neurocircuits. Together, these findings suggest that the combination of genetic and imaging studies may help to elucidate the neurobiological correlates of dysfunctional learning processes in psychosis and addiction and to identify new targets for behavioural and pharmacological interventions.