

Chemical Monitoring of Neurotransmission with Microelectrodes

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Neurons within the intact brain secrete chemical substances to communicate with neighboring cells. These substances, termed neurotransmitters, comprise an important way in which information is relayed and processed during behaviour. However, until recently, this chemical communication had not been characterized because chemical sensors suitable to monitor subsecond chemical events in micron dimensions were unavailable. We have employed cyclic voltammetry at carbon-fiber microelectrodes to examine the dynamics of neurotransmitter concentrations within the brain of rats. Measurements with subsecond time resolution within the intact brain give a real time view of neurotransmitters during goal-directed behaviours. These findings reveal an unanticipated spatial and temporal heterogeneity of dopamine transmission within the brain that encodes specific responses.