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**Ethanol-Induced Alterations of Monoamines measured by in Vivo
Microdialysis in Rats: A Meta-Analysis**

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A variety of studies use in vivo microdialysis as a quantification method to observe the release and dynamical behavior of neurotransmitters in different brain regions of various species. Pharmacological manipulations such as acute administration of different doses of ethanol can be performed afterwards. Most of the published studies, concerning in vivo microdialysis, observed changes after drug administration in laboratory rats. Thus far the main objective of these studies was to observe the ethanol-induced effects on monoamines in forebrain regions. We performed a meta-analysis on published datasets of in vivo microdialysis measurements to assess the concentration-dependent effects of ethanol on monoamine levels within 18 distinct brain regions in adult rats, which were identified within a neurocircuitry for modeling drug effects. A total of 7407 rats were used in the extracted datasets. The analysis of the basal values of noradrenaline, serotonin and dopamine in those regions revealed hardly any dependencies on gender, strain or state of consciousness. These values, which showed a significant difference, were considered separately. However the acute administration of ethanol appears to increase the level of all three monoamines globally. Either i.p. or i.v. administration with doses of 0.25-2.5g/kg or local infusions with doses between 25 and 300 mM have been used. Moreover the analysis revealed a positive correlation between the magnitude of increase (peak % baseline) and the applied doses of ethanol, while the temporal occurrence of the ethanol-induced peaks in the concentrations (peak time) was mostly negatively correlated. This observation suggests the role of monoamines as primary targets for the action of ethanol in the brain. Our reference-work could be helpful for experimenters who are concerned with in vivo microdialysis and in silico experiments. It is a universal framework with an optimal design for further studies.