

THE MISTAKE SYSTEM OF THE BRAIN AND ETHANOL: A DIRECT PATHWAY POSSIBLE?

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In a previously formulated hypothesis of alcohol related glucose dependent system of error monitoring and processing, we suggested mechanisms for alcohol's indirect disruption of the error monitoring and processing system (referred here as the mistake system of the brain). Reviewing recent breakthroughs in ethanol metabolism and the associated enzymes, tissue prevalence of their polymorphic forms, as well as blood brain barrier structure-functions relationship, we suggest that a direct pathway is possible in the disruption of the mistake system of the brain. The major arguments supporting the direct disruption of the mistake system of the brain include the following: the molecular size and spatial configuration of the ethanol molecule or its metabolites and the 'free pass' size and the molecular configuration of the blood brain barrier; advanced radiological studies of brain cells and functions at different organismal states; metabolic diversity of ethanol and its metabolic forms and the kinetics of the associated enzymes in brain cells at different regions; prevalence rate of the polymorphic forms of ethanol metabolizing enzymes. The direct pathway of ethanol related disruption of the mistake system of the brain represent an improvement on the formerly suggested indirect mechanism of alcohol related glucose dependent system of error monitoring and processing. Therefore, both direct and indirect pathways are involved in the disruption of the error monitoring and processing system of the brain.