Editorial

Role of Endocannabinoid Signaling in Alcohol and Drug Addiction

Alcoholism is a psychiatric disorder characterized by impaired control over drinking, leading to tolerance, physical dependence, uncontrollable craving and relapse. The mechanisms underlying these disorders are poorly understood at the present time. Alcohol effects are mediated *via* several intracellular signal transduction pathways involving many classical neurotransmitters and ion channels in different brain regions. There is a growing body of evidence now suggesting a significant role for the endocannabinoid signaling (EC) system in a number of alcohol-related behaviors. Endocannabinoid (EC) signaling consists of cannabinoid (CB) 1 receptor and endogenous ligands, anandamide and 2-arachidonyl glycerol, that bind to CB1 receptor and the enzymes involved in the synthesis, transport and degradation of the ECs. Recent studies have demonstrated the involvement of the EC signaling in a number alcohol and addiction-related behaviors that include voluntary alcohol consumption, alcohol tolerance and dependence and addiction to food and other drugs of abuse. The studies investigating the mechanisms underlying the addictive behaviors mediated through EC signaling have been the subject of intensive research and these efforts may lead to development of newer therapies to treat many of the addictive behaviors.

The current issue addresses some of these problems and discusses possible mechanisms that can explain addictive behaviors and also the possible therapeutic utility of drugs targeted against the components of the EC signaling in the treatment of addictive behaviors. The article by Hungund and Vinod reviews the current status on the role of the EC signaling in alcohol tolerance, dependence and voluntary alcohol consumption. The following article by Colombo *et al*. describes the suppressing effects of CB1 receptor antagonist rimonabant on alcohol self-administration in a preclinical rat model. Loren Parsons and his colleagues discuss their findings on the brain regional influence of CB1 receptors in alcohol self-administration in rats.

The article by Manzanares *et al*. elaborates the current understanding of the role played by opioid/cannabinoid systems in alcohol dependence and possible utility of drugs targeted against the two systems in alcohol dependence. This article also discusses the possible implications of preclinical findings to human alcoholism and drug addiction.

Mesolimbic dopaminergic system mainly consists of dopaminergic neurons that originate in VTA and project terminals into prefrontal cortex, nucleus accumbens and amygdale, which are known to play a major role in reward mechanisms. The article by Formenti *et al*. discusses the possible interplay between VTA dopamine neuronal firing and CB1 receptors that are co-expressed in these neurons.

Cannabinoid CB2 receptor, which until recently was assumed to be exclusively localized in peripheral tissue, has recently been shown to be present in central nervous system (CNS). The article by Onaivi *et al*. discusses the CNS effects of CB2 receptor and its possible involvement in drug addiction and neuropsychiatric disorders.

Finally, the review of the literature on the teratogenic effects of prenatal THC exposure on early neurodevelopment is presented by Psychoyos *et al*. They discuss the neurodevelopmental and neurobehavioral consequences of marijuana abuse during pregnancy in the offspring.

Overall, this special edition provides comprehensive picture about the role played by this interesting neurotransmitter/ neuromodulatory system in a number addictive behaviors and provides opportunities for testing of newer therapies using drugs targeted against the components of the EC signaling to treat addiction-related behaviors.

Basalingappa L. Hungund
(***Guest Editor***)
Nathan Kline Institute for Psychiatric Research
140 Old Orangeburg Road
Orangeburg
NY 10962
USA
E-mails: hungund@nki.rfmh.org and vyaragudri@nki.rfmh.org

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