**UNDERSTANDING THE NEUROBIOLOGY OF ALCOHOL ABSTINENCE: THE OXYTOCIN STORY**

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Chronic ethanol use and abstinence is associated with the development of emotional deficits and is well known to cause cognitive and motor impairment following abstinence. Although several systems have been identified, the exact neurobiological mechanisms implicated in alcohol addiction are not well understood. We recently demonstrated profound dysregulation of the opioid system following chronic opioid treatment and withdrawal and have identified oxytocin as a potential target for the treatment of emotional impairment following opioid abstinence and relapse prevention (1). Here we sought to investigate the effects of chronic alcohol consumption, as well as acute and long-term withdrawal on mu- opioid (MOPr) and oxytocin (OTR) receptor binding in the brain.

Ethanol was provided in liquid diet using a 10-day escalating-dose paradigm (2.3%-2 days, 4.2%-2 days and 7%-6 days). Different mice cohorts were then let to spontaneously withdraw for one, four or seven days.

Chronic ethanol exposure induced an overall increase in OTR binding in the medial septum and ventral limb of the diagonal band of Broca. A transient downregulation of OTR was observed in the nucleus accumbens core following 1-day withdrawal, which returned to control levels after 4-days withdrawal. OTR was also upregulated in the basomedial amygdala following 7-days withdrawal. An overall increase in MOPr binding in the basomedial amygdala was demonstrated in the alcohol exposed groups compared to controls. MOPr binding was transiently increased 4-days post-withdrawal in the caudate putamen and nucleus accumbens, which returned to control levels after 7-days withdrawal.

Collectively, our findings indicate that chronic alcohol use and abstinence can induce brain-region specific neuroadaptations of the OTR and MOPr systems, which may contribute to the neurobiological mechanisms underlying excessive alcohol drinking and the emotional consequences of ethanol withdrawal.

1. [Zanos P](http://www.ncbi.nlm.nih.gov/pubmed?term=Zanos%20P%5BAuthor%5D&cauthor=true&cauthor_uid=24129263) *et al.* (2014) *Neuropsychopharmacology* 39(4):855-65