ALTERATIONS OF THE POMC-PROMOTER-METHYLATION AND ITS DERIVATIVE ALPHA-MSH IN A RODENT MODEL FOR ALCOHOL DEPENDENCE

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Introduction. Till this day the molecular mechanisms underlying alcohol dependence are far from being understood in its entirety. Repeatedly the HPA-axis got in the focus of research for alcohol dependence. Many of these works show an association between alcohol dependence and the answer of the HPA-axis on its different levels. POMC and its derivative Alpha-MSH as part of the HPA-axis are supposed to mediate alcohol craving. To investigate the role of Alpha-MSH for craving we used a rodent model for alcohol dependence.

Methods. To prove our hypothesis we used a rodent model with 90 male wistar-rats which were housed individually in single cages. Water, 3 alcohol-solutions (5%, 10% and 20%) and food were offered to the animals ad libitum for one year (4 bottle paradigm), whereas control groups got 4 bottles filled with water. The continuous alcohol consumption of the animals was interrupted by scheduled alcohol-deprivation-phases. During the animal trial a manifest alcohol dependence was induced. The blood and tissues, obtained at the end of the trial, were analysed using direct bisulfite-sequencing (methylation status) and ELISA (Alpha-MSH protein levels).

Results and Discussion. The group of alcohol-dependent animals showed an altered methylation status of the POMC-gene-promoter and altered levels of Alpha-MSH compared to the control group. These findings are in line with our previous results showing a significant correlation between symptoms of alcohol craving and POMC-promoter methylation. These new data confirm our results from humane materials and clarify the meaning of Alpha-MSH for craving in alcohol-dependence.