

Alcohol addiction is one of the most serious, unresolved problems of the contemporary society, with the impact both on physical and mental health and economy of the afflicted individuals and their families. We already know that drug and alcohol addiction involves dysregulation of the brain circuits. The aberrant activity is observed in the regions which in healthy individuals control learning processes and perception of natural rewards, such as food and sex. At the same time “the neuronal codes” that predict compulsive alcohol seeking and consumption, hallmarks of addiction, are still unknown. Thus the successful therapy of addiction is still missing. In the current project we shall investigate the role of the CA1 area of the hippocampus in the regulation of alcohol-driven behavior. The function of this region has been previously associated mostly with coding of spatial information. The function of this brain region in alcohol addiction is poorly understood, however, experiments conducted in our Laboratories showed that it is highly possible. We will look for neuronal activity patterns in the hippocampus that are induced by early alcohol experience and predict compulsive alcohol seeking and consumption. To achieve this aim we will integrate cutting-edge technologies: imaging of neuronal activity in behaving animals, genetic and chemogenetic manipulations and a novel animal model of alcohol use disorder. This study will extend our understanding of the cellular basis of alcohol addiction.