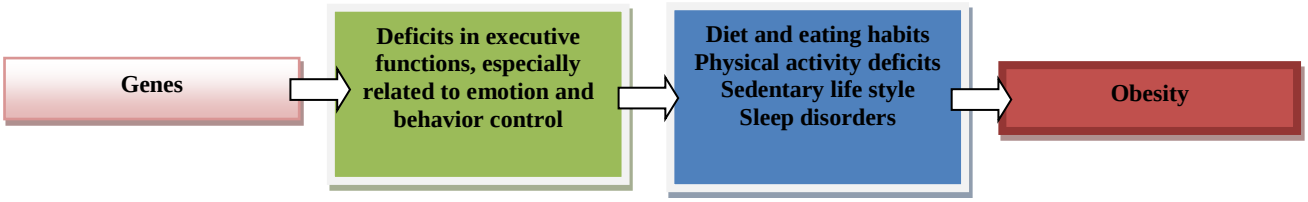
In the last three decades, obesity has become a serious health problem worldwide. Because of the negative effects of excessive weight gain on children's physical and mental health and an increased risk of overweight and obesity in adulthood, prevention and treatment of overweight is now one of the biggest challenges of modern societies. For this reason, the number of studies on the factors underlying obesity in children and favoring the persistence of obesity into adulthood is increasing. Attention-deficit/hyperactivity disorder (ADHD) is one of the obesity risk factors that is intensively studied recently.

ADHD is one of the most commonly diagnosed neuropsychological disorders in schoolchildren and is manifested by three categories of symptoms: inattention, impulsivity and hyperactivity. Its prevalence ranges from 5 to 10% among schoolchildren. ADHD has genetic background modulated by environmental factors. Twin and adoption studies estimates the heritability of ADHD on the level of 76%. Among genes related to increased risk of ADHD are genes of dopaminergic, noradrenergic and serotonergic systems and those related to neurotransmission and neuronal plasticity, cell adhesion, migration, neurogenesis, signaling process like apoptosis or inflammation or transcriptional factors.

Studies from last 30 years suggest that ADHD may be a risk factor of excess body weight. Those revelations are of high significance. Studies of the link between ADHD and obesity gives possibilities to reveal new important predictors of obesity beyond factors related to etiology, neuropsychological features of ADHD or their consequences. Nevertheless there are only a few studies examining the mechanism of association between ADHD and obesity. We believe that the most promising direction of further research is the assessment of the relation between obesity in children with ADHD and selected genes, neuropsychological features and life style. Genetic studies of early stage indicate possible role of such genes as *DRD2* and *DRD4*, *BDNF*, *MC4R*, *FTO*, *NUDT3*, *GPRC5B* and *GPCR*. These results encourage to conduct wider investigation in this area. Nevertheless discovering the link between genes and obesity in children with ADHD does not answer the question what mechanism connects both disorders (ADHD and obesity). We presume that impairments of executive functions, especially related to impulse and emotion control, are the link between the genes and obesity. These deficits are related to impulsiveness, elevated sensitivity to immediate reward, problems with behavior regulation, inhibitory control, reward-deficiency syndrome. These factors could lead to obesity via tendency to having inappropriate diet, binge eating, lower level of physical activity, sedentary lifestyle and sleep disturbances.

Therefore, we plan to assess a comprehensive, genetic-neuropsychological-behavioral model of obesity determination in ADHD, that emerges from above mentioned premises:



The aim of the research is examination of the role of genes and executive functions in etiology of obesity in children with ADHD. The study will explore single as well as combined effects of gens, executive function impairments, life style (physical activity, nutritional and sleep habits) on link between ADHD-obesity.

We believe that the results of proposed project will indicate the factors contributing to development of excessive body weight in these children. This is of high importance because those factors may be significant determinants of obesity in general population. Therefore the results of the project might be used to prepare a new, more effective prevention and therapeutic programs aimed to decrease the rate of obesity and its health and economic consequences. Moreover, the results of the project might be useful in preparing a new therapeutic programs aimed to improve quality of life of children with ADHD.