

## **ABSTRACT**

Acute cold exposure increases the risk of sudden cardiac events, similarly exposure to constant light negatively affects the cardiovascular system. However, the individual effects of these factors and the effect of their combination on cardiomyocytes are not yet known. The thesis deals with the influence of a 3 day cold exposure and constant light on the expression of  $\beta$ -adrenergic receptors and associated G-proteins in association with apoptotic signals in the left ventricle of the Wistar rat heart. In this work apoptotic proteins BAX, BCL2, caspase 8 and important components of  $\beta$ -adrenergic signalization -  $\beta$ 1,  $\beta$ 2, G-proteins, Gas, Gi1/2 and Gi3 were determined. The relative expression of the proteins was analyzed by Western blotting. The results confirm the detrimental effect of cold and light exposure. However, the synergistic effect of these two stressors shows surprising results.