

### *Abstract (in English)*

Creatine kinase system could be considered the energetic frontline of a cell. It creates and maintains a cellular energy storage and at the same time enables the very fastest response to a high energy demand. Aims of this thesis were to thoroughly describe the creatine kinase system, its role in the energy metabolism and metabolism of creatine molecule itself. As a popular nutritional supplement, there was an emphasis on creatine's impact on the physiology of skeletal muscle and also its higher intake. Furthermore some of the creatine-related disorders were described, as well as research of their treatment. Lastly, the branch-chained amino acids were researched for possible synergic effect with creatine, connection between these two was found through the mTOR signalling pathway.