Heme-containing sensor proteins are heme proteins, which are divided into two groups: heme-sensing and gas-sensing proteins. The function of heme-sensing proteins is affected by heme availability. Association (or dissociation) of heme moiety of heme-sensing protein regulates various physiological functions, including protein kinase activity, transcription and other important functions essential for cell survival. In gas-sensing proteins, heme acts as the sensing site for binding of gaseous molecules (including O2, NO and CO) and indirectly regulates physiological functions, including protein kinase activity, transcription and other important functions essential for cell survival.
The recent studies on heme-containing senzor proteins published in scientific journals are summarized in this thesis. The experimental part of this thesis focused on the specific heme-containing sensor protein – a globin-coupled histidine kinase from Anaeromyxobacter sp. strain Fw 109-5 (AfGcHK). The aim of this thesis was to amplified and isolate plasmid carrying gen for AfGcHK. Consequently the protein was expressed in E.coli BL-21(DE3) and the protein was isolated. Based on the results, the isolation process was optimized. Moreover, the purified preparation of isolated AfGcHK was prepared in more than 99% of homogeneity. However, there was only 3% of preparation in the holo–form.
Key words: heme-containing sensor proteins; heme-sensing proteins; gas-sensing proteins; heme; globin-coupled histidine kinase from Anaeromyxobacter sp. strain Fw 109-5 (AfGcHK); plasmid isolation; protein expression