Morphine is a clinically very important drug from the opioid group that is used for treatment of severe pain because of its strong analgetic effect. Opioid receptors mediating the morphine effect interact with the $G_{i/o}$ class of trimeric G-proteins. Opioid receptors also occur in heart tissue and morphine can thus potentially exercise its effect on the function of this organ. The major aim of this project was to pursue consequences of long-term treatment with morphine on expression and distribution of selected heterotrimeric G-protein subunits in the rat heart. Potential cardioprotective effects of this drug have also been studied. Laboratory rats of the *Wistar* strain were treated with morphine (1 mg/kg/day or 10 mg/kg/day) for 10 or 28 days. The control group was treated with saline solution. Prolonged treatment with morphine did not cause any effects on $G_s\alpha$, $G_i\alpha$, $G_z\alpha$, $G_{q/11}\alpha$, $G\beta$ subunits, but the expression of $G_o\alpha$ rather decreased. The results of subsequent experiments showed that prolonged administration of high doses of morphine may reduce the area affected by infarction and reduced the frequency of ventricle arrhythmias depending on dose and duration of morphine administration.

Key words: morphine, myocardium, opioid receptor, G-protein subunits, infarction.