

Flavonoid treatment of human erythrocytes protects membrane-bound NADH-methemoglobin reductase against oxidative damage

Ludmila M.Lukyanenko, Svetlana V.Kulak, Ekaterina I.Slobozhanina

The activity of NADH-methemoglobin reductase in membranes isolated from human erythrocytes subjected to the action of phenylhydrazine in sublytic concentration was studied. A decrease of enzyme activity was shown dependent on the concentration of phenylhydrazine. After exposure of human erythrocytes to 1.0-1.5 mM phenylhydrazine (15 min, 37°C) activity of the membrane-bound NADH-methemoglobin reductase was about 40% of the initial level. Increased level of membrane-bound methemoglobin was also observed. It was found that preincubation of human erythrocytes with 1×10^{-5} M quercetin or 1×10^{-5} M genistein-C-glucoside in isotonic Na-phosphate buffer, pH 7.4 (2 hours, 37°C) prevented the phenylhydrazine-induced inhibition of activity membrane-bound NADH-methemoglobin reductase. The observed effects of two flavonoids studied show their significant potential as antioxidant (radicalscavenging) agents for protection of cells from free radicals.