

The peculiarities of electrostatic interaction of pancreatic and microbial ribonucleases with macrophages in vitro

Kalacheva N., Narulina A., Kurinenko B.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The interaction of RNase A and RNase Bacillus intermedius with peritoneal macrophage of rats has been studied. To estimate the efficiency of this interaction the spontaneous chemiluminescence and induced by phagocytosis chemiluminescence of macrophages were investigated. It has been shown that electrostatic interaction of enzyme proteins with negatively charged cell membrane makes substantial contribution to the development of chemiluminescence reply of macrophages. The RNase A, which is more basical than the other (i. e. it has larger value of pI) is less effective with respect to macrophages. The calculation of total charge and dipole moment of pancreatic and microbial RNases showed that the efficiency of interaction between protein polycation and a cell was not connected with pI and depended on the charge and its distribution on the surface of protein molecule at the given pH value.

Keywords

Electrostatic interaction, Macrophage, RNase A, RNase Bacillus intermedius, Total charge and dipole moment