INFLUENCE OF DIETHYLDITHIOCARBAMATE ON THE ACTIVITY OF ecto-ATPase IN LYMPHOCYTES OF RATS: EX VIVO STUDIES

Leszek Purzyc1,*, Ireneusz Calkosiński2, Dorota Polak-Jonkisz3

1Department of Medical Biochemistry and 2Department of Physiology, Wrocław Medical University, Chayulinskiego 10, PL 50-368 Wrocław, 3Department of Pediatric Nephrology, Wrocław Medical University, Skłodowskiej-Curie 50/52, PL 50-368 Wrocław, Poland


Influence of diethyldithiocarbamate (DTC) on the activity of ecto-ATPase (plasma membrane-bound enzyme participating in a cascade of reactions leading to the formation of adenosine – a modulator of inflammation) was examined on the lymphocytes isolated from the spleen of rats with inflammation. DTC was administered at doses of 4 mg/kg and 290 mg/kg using two modes of administration. It has been observed that:

a) an inflammation caused an increase in ecto-ATPase activity in both subpopulations of lymphocytes; in the case of B-lymphocytes, the maximum of activity occurred 48 h and in the case of T-lymphocytes, 72 h after the injection of carrageenin;

b) a single injection of DTC at both doses, 24 h before or 24 h after carrageenin injection caused a decrease in ecto-ATPase activity in B-lymphocytes and its increase in T-lymphocytes throughout the whole measurement period, which was not observed when DTG was administered only after provocation of inflammation;

c) administration of a high dose of DTC together with equimolar doses of disulfiram and C5 led to a decrease in ecto-ATPase activity and 5'-nucleotidase level in B-lymphocytes, which is bound to the former enzyme;

d) in in vitro studies, both populations of lymphocytes isolated from the rats treated with a four-fold dose of DTC showed higher resistance of ecto-ATPase to inhibitors of the enzyme and antagonists of type P2 purinoceptors.

Key words: carrageenin, inflammation, rats, carbon disulfide, diethyldithiocarbamate, disulfiram, ecto-ATPase, lymphocyte, 5'-nucleotidase