Current Topics in Biophysics (Zagadnienia Biofizyki Współczesnej) vol. 20 (1), 1996, 46-52

ESR studies on the generation of nitric oxide in rejecting rat heart allografts and *in situ* growing tumors

Przemysław M.Płonka, Beata K.Płonka, Stanisław Pajak, Stanisław J.Łukiewicz

The generation of nitric oxide (*NO), associated with a characteristic ESR "triplet" signal originating from NO-hemoprotein complexes is a well known, common feature of allograft rejection and anti-tumor defense. This paper describes some new observations in the field of transplantology and experimental oncology, which further substantiate the parallelism between these two groups of phenomena. In particular, their similarity was found to be determined by: (1) analogical sources of nitric oxide, (2) comparable kinetics of changes in its amount during rejection and anti-tumor defense, (3) enhanced production in pre-sensitized graft recipients, and in tumors growing in immunologically incompatible hosts, (4) possibility of restoring its generation in genetically impaired hosts with macrophages unable to produce nitric oxide, by stimulation of the immune system. In general, the similarity of allograft rejection and anti-tumor defense finds its expression in a number of common immunological mechanisms. The paramagnetism of nitric oxide makes it possible to follow its generation in a quantitative way upon use of ESR spectroscopy.