

BIOLOGICAL PROPERTIES OF ISOPROSTANES

Summary

Oxidation of polyunsaturated fatty acids changes the biological activity of phospholipids that are important for the integrity of cellular membranes. Two pathways of lipid peroxidation can occur: enzymatic and nonenzymatic. Free polyunsaturated fatty acids can be oxidized by multiple enzymes forming the reactive lipid mediators such as prostaglandins, thromboxanes, prostacyclins, lipoxins and hepoxylins. Nonenzymatic lipid peroxidation process initiated by free radicals leads to the formation of different products, mainly isoprostanes, isothromboxanes, isolevuglandins and isofuranes. The review summa-

rized current knowledge on the structure and formation of final products of nonenzymatic oxidized polyunsaturated fatty acid (arachidonic acid, -6). Potential applications of its oxidized metabolites, especially isoprostanes as the most important biomarkers of oxidative stress in human diseases are determined. Biological activities and physiological role of isoprostanes, especially their effects on the vessel wall are described. The properties of phytoprostanes derived from plants are also characterized. The quantitative used for the estimation of isoprostanes are presented.