

Photostability of Lipid Components of Human Blood Plasma Lipoproteins during Exposure to Long Wave Ultraviolet Radiation (UV-A) alone and in the Presence of 8-Methoxypsoralen

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In this work, photooxidation of lipid components isolated from human blood plasma lipoproteins (VLDL, LDL and HDL) after irradiation with UV-A alone and in the presence of 210 $\mu\text{g l}^{-1}$ 8-methoxypsoralen (8-MOP), called PUVA method (psoralen+UV-A), was studied. No significant changes in the lipids isolated from lipoproteins irradiated without 8-MOP were found. In the case of lipoprotein irradiated in the presence of 8-MOP the ESR fluidity study using methyl-5-doxyloleate as spin label showed that photostability of lipid components of lipoproteins decreased in order: VLDL>LDL>HDL. The FT-IR and $^1\text{H-NMR}$ study revealed that lipid components of LDL and especially of HDL fraction during PUVA exposition undergo photodegradation, probably due to oxidation of unsaturated phospholipids by reactive oxygen species (mainly singlet oxygen) produced by 8-MOP sensitization. In contrast, lipids from PUVA treated VLDL fractions were practically intact. These results may be explained by the various antioxidant concentrations in individual lipoprotein fractions or by difference in diameter of VLDL, LDL and HDL particles influencing on accessibility of reactive oxygen species to lipoprotein lipid components. Whereas, it is not clear whether in conditions of experiment the cyclobutane photoadducts of 8-MOP with unsaturated lipids were formed.