

Lipofuscin-like pigments are products of reactions involving free radical attack onto molecules with nucleophilic groups. They can be formed, for example, in the reactions between lipid peroxidation decomposition products, such as aldehydes, and amino-group containing compounds, e.g. phospholipids, peptides. Owing to their intrinsic fluorescent properties LFP can be easily measured. LFP are relatively stable and therefore have been successfully used as robust markers of oxidative damage. We undertook the metabolomic studies, where fluorescent LFP were first analysed spectrofluorimetrically by using tridimensional and differential fluorescence spectral arrays. After that, certain LFP were analysed by means of high performance liquid chromatography, in order to resolve the mixture of compounds into distinct fractions. For this purpose we used LFP prepared after isolated heart mitochondria had been exposed in vitro to oxidative stress initiated by various triggers. LFP were also analysed during early development in rat brain, which is accompanied by transient increase in oxygen concentration, and in erythrocytes from patients with Alzheimer's disease. We developed HPLC methods for qualitative analysis of LFP of different origin. This analysis unfolded that LFP indeed consist of many chromatographically different species. By this way we confirmed the existence of a great number of individual fluorescent species involved in pathophysiology of some diseases and conditions.