

Discovered over 20 years ago, the Hippo signalling pathway is one of the major regulators of organ growth, proliferation and apoptosis. Moreover, disorders in this pathway in the form of overexpression of YAP protein are found in an increasing number of cancers, where it stimulates both proliferation and evading from apoptosis. The biological activity of YAP is determined by its phosphorylation by appropriate kinases. Depending on the site of phosphorylation, YAP can play opposing biological roles, both protecting cells from apoptosis and inducing it. So far, however, it is not known what role the YAP protein plays in the process of UV-induced apoptosis. The role of the YAP protein in this context is at least ambiguous: DNA damage or activation of the Fas death receptor results in binding of YAP to the transcription factor p73, resulting in the initiation of a cell death program. On the other hand, however, YAP overexpression can protect against apoptosis induced by stressors such as UVC, chemotherapeutics or kinase inhibitors. Because of the increasing evidence of non-melanoma skin cancers, in which the main contributor is UV exposure, it is necessary to investigate the phenomena that initiate cutaneous carcinogenesis. Therefore, the main purpose of the study is to clarify the role of YAP in UVB / SSR-induced apoptosis. Thanks to the use of UV lamps, we want to produce in the laboratory a phenotype of "Sunburn cell" to trace the role of YAP protein in regulation of apoptosis by examining its effect on the mechanism of DNA damage response, activation of intra- and extrinsic pathways of apoptosis and stoppage of the cell cycle. The study is innovative both because of the rich methodology used and the topic that has been not studied so far. We have been conducting research on the influence of ultraviolet radiation on the skin biology for several years and we are experienced in both cell culture preparation and the use of appropriate molecular biology techniques. This project is a natural continuation of our research on the role of UV radiation in skin cancer development.