

Abstract

This bachelor's thesis focuses on a comparison of studies mainly preclinical and clinical research that investigate the photobiomodulatory effect of radiation on the retina. The main parameters for comparison were the type of light source, wavelength, irradiance, energy, energy density, irradiation time, treatment interval, distance from the point of exposure and type of biological system. In most studies the retinal pigment epithelium was examined. The retinal pigment epithelium contains a large number of mitochondria which activity is essential for the proper function of the eye. A result of this thesis was to verify the hypothesis that the parameters of light used in photobiomodulation vary between studies so much that it is difficult to develop a reliable methodology leading to long-term positive effects and to propose a plausible photoacceptor of light radiation. Comparison of the studies showed that the irradiance parameters are similar in the selected studies yet further research is needed to select the most appropriate combination of these parameters. Cytochrome c oxidase contained in mitochondria and nitric oxide appear to be the key photoacceptors but they may not be the only photoacceptors in the retina. Given the great therapeutic potential of photobiomodulation as a noninvasive treatment of various retinal diseases, it appears to be important to continue to study cellular mechanisms and appropriate of parameters for photobiomodulation therapy.