

Photogeneration of superoxide anion by iris of the human eye under *in vitro* conditions

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Iris of the human eye controls the amount of light transmitted to the retina. This melanin-containing tissue can be exposed to significant fluxes of ultraviolet and visible light transmitted by the cornea. Although melanin is usually considered to be an important photoprotective pigment, it can also photogenerate reactive oxygen species. To evaluate the importance of such photoreactions that under certain conditions may occur *in situ*, we measured *in vitro* the efficiency of oxygen photoconsumption and photogeneration of superoxide anion (SOA) by iridial melanin. Irradiation of human and bovine iridial homogenates with UV-VIS light led to consumption of oxygen, which was accompanied by generation of SOA. When normalized to equal content of protein and melanin, all human iridial samples, regardless the age of the donors and color of their eyes, photogenerated similar amounts of SOA. Our data suggest that melanin may be a key chromophore responsible for the photoformation of SOA and hydrogen peroxide (HP) in the aqueous humor of the human eye. Ascorbate, typically present at high concentration in the anterior chamber of the human eye, considerably accelerated melanin-mediated photoconsumption of oxygen and the corresponding generation of HP. The latter phenomenon has been explained by photoinduced electron-transfer properties of the iridial melanin.