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The role of singlet oxygen and free radicals in photosensitized reactions and photodynamic action – Udział tlenu singletowego i wolnych rodników w reakcjach fotouczulanych i zjawiskach fotodynamicznych

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Three types of photosensitized reactions (PR) that can occur in biological systems are discussed in this review paper. Type I and type II of PR are oxygen-dependent processes that involve free radicals and singlet molecular oxygen, respectively. Type III of PR does not depend on oxygen and leads to free radical and/or molecular adduct formation. Physicochemical properties of singlet O_2, hydroxyl radical and superoxide anion are summarized and methods for detection and characterization of these reactive species are described. Photosusceptibillty of nucleic acids, proteins and lipids, as possible biological targets in photodynamic action is discussed. Molecular basis for photodynamic therapy -- a new, photobiological method for cancer treatment is also outlined.