

**Photocatalysis and photosensitization in biological and technical systems**

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This review presents some fundamental principles of photoinduced physical and chemical processes which play a vital role in living organisms, ecosystems and certain technologies. A brief description of mechanisms, significance and applications of photocatalysis, photosensitization and photoprotection is provided. Artificial photocatalytic processes based on the semiconductor (TiO<sub>2</sub>)-sensitizer-O<sub>2</sub>-h $\nu$  redox system, modified PSI and PSII of green plants as well as natural processes involving dark paramagnetic biopolymers –humus acids and melanins are discussed. It is shown how these processes are used for photocatalytic and photosensitized detoxication in ecosystems or photoprotection of organisms and how they can be employed to new technologies relevant to environment protection, solar technologies and alternative energy sources. Potential expansion and application of photoprocesses is suggested.