Photochemistry of photoinduced membrane leakage

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Irreversible membrane damage, which lead to membrane leakage, is key to the efficiency of cell death caused either by photosensitizers (PS) used in Photodynamic Therapy (PDT) or by PS naturally present in the skin. Experiments based in absorption/emission and mass spectroscopic, as well as, theoretical simulations, showed that lipid aldehydes have a key role in the formation of transmembrane pores. Processes depending on direct contact between photosensitizers and lipids were revealed to be essential for the progress of peroxidation and for aldehyde formation, providing a molecular-level explanation of why membrane binding is so well correlated with the efficiency of photosensitizers. Consequences of this find will be showed and discussed in experimental models of PDT and of skin aging.