**Reactive Oxygen Species (ROS) and Their Applications to Photodynamic Therapy**

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This lecture describes studies of interfacial ROS, in particular the reactive species singlet oxygen (1O2). Studies of alkene surfactants with airborne 1O2 at the air-water interface led to regioselective formation of surfactant hydroperoxides. Prenylsurfactants with increasing numbers of carbon atoms in the hydrophobic chain have provided insight to the origin of the regioselectivity. Studies of a 3-D printed superhydrophobic photosensitizer have provided ideas for generating surfaces that are highly effective in interfacial control of peroxidation reactions and in photodynamic therapy. Singlet oxygen is fascinating, *not in a singular way*, but from the multiplicity of reactions it undergoes on liquid and solid supports. The above reactions give insight into oxidation mechanisms, are of utility in synthesis, and are biologically relevant models of 1O2 at membrane or marine aerosol surfaces.

