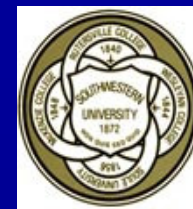


The Role of Oxygen in Photoinduced DNA Damage



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We investigated the mechanism of photoinduced DNA damage by the anthracycline antibiotic daunomycin. We have shown that photoexcitation of daunomycin leads to substantial levels of guanine specific oxidation that is dependent on molecular oxygen. In addition, we were able to identify that the oxygen species involved is the superoxide radical. From these results, we conclude that photoexcitation leads to a charge transfer mechanism where activated daunomycin abstracts an electron from the base guanine base and, in turn, reduces oxygen to form superoxide. Production of reactive oxygen species derived from superoxide could also contribute to the DNA damage pathway.

