Enhancement of riboflavin-mediated photo-oxidation of glucose 6-phosphate dehydrogenase by urocanic acid

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We have investigated the riboflavin (RF)-sensitized inactivation of glucose 6-phosphate dehydrogenase (G6PD) in the presence and absence of trans-urocanic acid (UCA). The inactivation of the enzyme results from its direct oxidation by the excited triplet RF in a Type-I-photosensitized reaction whose efficiency increases at low oxygen concentration. The addition of histidine to the system produced no change in the inactivation rate, discarding the participation of singlet oxygen in the reaction. On the other hand, the presence of UCA results in its bleaching, with a significant enhancement of RF-mediated inactivation of G6PD. Both the consumption of UCA and G6PD are faster at low oxygen concentrations. UCA also produced a decrease in the sensitizer photodecompesition yield. These results indicate that the enhancement of the RF-mediated G6PD inactivation observed in the presence of UCA is not a singlet oxygen-mediated process. It is proposed that UCA consumption and its effect on G6PD in