

# Study of the Interaction between Triplet Riboflavin and the $\alpha$ -, $\beta$ H- and $\beta$ L-Crystallins of the Eye Lens

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Time-resolved photolysis studies of riboflavin (RF) were carried out in the presence and absence of  $\alpha$ -,  $\beta$ H- and  $\beta$  L-crystallins of bovine eye lens. The transient absorption spectra, recorded 5 ns after the laser pulse, reveal the presence of the absorption band (625-675 nm) of the RF neutral triplet state ( $\tau = 42$  ns) accompanied by the appearance of a long-lived absorption ( $\tau = 320$  ns) in the 500-600 nm region due to the formation of the semireduced RF radical. The RF excited state is quenched by the crystallin proteins through a mechanism that involves electron transfer from the proteins to the flavin, as shown by the decrease of the triplet RF band with the concomitant increase of the band of its semireduced form. Tryptophan loss on RF-sensitized photo-oxidation of the crystallins when irradiated with monochromatic visible light (450 nm) in a 5% oxygen atmosphere was studied. A direct correlation was found between the triplet RF quenching rate constants by the different crystallin fr