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Study of the chemical structures of the photo-cross-linking products between Tyr and the 5-azido-2-nitrobenzoyl residue

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Abstract

Irradiation of *N*-(tyrosyl)-*N'*-(5-azido-2-nitrobenzoyl)-1,2-diaminoethane (I) initiates chemical reactions that lead to different products depending on the experimental conditions. All of these products are attributed to the reactions of triplet 4-nitrobenzoyl nitrene (4NBN). The reactions of triplet 4NBN with the tyrosyl residue result in the formation of two distinct products: compound II, which is unstable in aqueous solution, and the stable compound cyclo-[1-(4'-nitro-3'-benzoyl)-2-(aminotyrosyl)-*N,N'*-ethylenediamine] (III). The formation of II is detected only in aerobic conditions. The unstable photoproduct II converts almost completely into compound III when its solution is concentrated. The photoproducts II and III have absorption spectra that are close to those of the photolabelled peptides. This finding is important for speculating about the chemical nature of the photomodification products of protein tyrosyl residues by the arylazide group.

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