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Activation of *N*-Nitrosodialkylamines by Near-Ultraviolet Irradiation: Formation of Directly-acting Mutagens and DNA-Damaging Products*

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On near-ultraviolet (UVA) irradiation in a phosphate buffer, *N*-nitrosomorpholine (NMOR) and *N*-nitrosopyrrolidine (NPYR) were converted into directly-acting mutagens. The activated NPYR was fractionated, and the active product was isolated. The compound was shown to be identical to α-phosphonooxy NPYR on the basis of several properties : retention times in high-performance liquid chromatograms, mutagenic specificity and potency, ultraviolet spectrum, and inactivation by phosphatase treatment. Photoactivation was inhibited by superoxide dismutase, and therefore superoxide is implicated as playing a key role in mutagen formation. *N*-Nitrosoproline (NPRO) and eighteen other *N*-nitrosodialkylamines were irradiated with UVA in the presence of ϕX 174 RFIDNA. The DNA underwent single-strand breaks to give RFII DNA, indicating that *N*-nitrosodialkylamines in general have this property. DNA chain cleavage was inhibited both by superoxide dismutase and hydroxyl-radical scavengers. These results provide new information on the genotoxic mechanism of action of *N*-nitrosodialkylamines.

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