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Design, Synthesis, and Biological Activity of O-phenyl-N-(9'-acridinyl)-hydroxylamines

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Design, Synthesis, and Biological Activity of O-phenyl-N-(9'-acridinyl)-hydroxylamines

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DNA intercalates, such as derivatives of 9-aminoacridine, can be effective anti-tumor agents. These compounds associate strongly with DNA, which can lead to cell cycle arrest and apoptosis; however, they can also have a similar effect on healthy cells. O-phenyl-N-(9'-acridinyl)-hydroxylamine, a novel anti-tumor compound, should be less susceptible to hydrolysis in vivo than existing 9-aminoacridine derivatives. The result would be a decrease in required effective dose in patients and a wider therapeutic window. The goal of this research is to synthesize O-phenyl-N-(9'-acridinyl)-hydroxylamine via the condensation of chloroacridine and an appropriately substituted O-phenylhydroxylamine. This compound will be isolated from the reaction mixture and extensively purified to prepare the target DNA intercalator. In addition, a series of related compounds can be prepared by selection of different arenes and aryl iodides in the first step of the synthesis. Once these O-phenyl-N-(9'-acridinyl)-hydroxylamines have been prepared, their properties, including binding affinity for genomic DNA, will be characterized.