Effects of changing the substituent group on the 4-series of O-benzyl-N-(9'-acridinyl)hydroxylamines on effectiveness as an antitumor agent

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Abstract:
As indicated by the use of *m*-Amsacrine (m-AMSA), the intercalating qualities of cancer medications are considered desirable due to their ability to prevent DNA replication in cancerous cells, thus initiating the process of apoptosis. However, m-AMSA is vulnerable to nucleophilic attack, and therefore had a short half-life. To eliminate these detrimental qualities, a series of O-benzyl-N-(9'-acridinyl)hydroxylamines were synthesized. The differing substituent groups on the 4-series of these molecules have been found to intercalated differently with DNA. One of the molecules synthesized and tested, O-(4-chlorobenzyl)-N-(9'-acridinyl)hydroxylamine was shown to have its DNA binding capacity remain stable under physiological conditions, a result determined via viscosity testing, thermal denaturation, and other observations.