

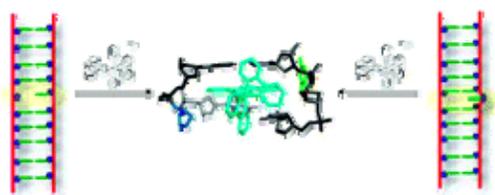
# Targeting Abasic Sites and Single Base Bulges in DNA with Metalloinsertors

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*Received February 27, 2008*



## Abstract:

The site-specific recognition of abasic sites and single base bulges in duplex DNA by sterically expansive rhodium metalloinsertors has been investigated. Through DNA photocleavage experiments,  $\text{Rh}(\text{bpy})_2(\text{chrysi})^{3+}$  is shown to bind both abasic sites and single base bulges site-specifically and, upon irradiation, to cleave the backbone of the defect-containing DNA. Photocleavage titrations reveal that the metal complex binds DNA containing an abasic site with high affinity ( $2.6(5) \times 10^6 \text{ M}^{-1}$ ), comparably to the metalloinsertor and a CC mismatch. The complex binds single base bulge sites with lower affinity ( $\sim 10^5 \text{ M}^{-1}$ ). Analysis of cleavage products and the correlation of affinities with helix destabilization suggest that  $\text{Rh}(\text{bpy})_2(\text{chrysi})^{3+}$  binds both lesions via metalloinsertion, as observed for Rh binding at mismatched sites, a binding mode in which the mismatched or unpaired bases are extruded from the helix and replaced in the base stack by the sterically expansive ligand of the metalloinsertor.