

**CHANGES IN DNA TERTIARY STRUCTURE FOLLOWING
DITERCALINIUM BIS-INTERCALATION OBSERVED BY AFM**

Torunn Berge, Nigel S Jenkins, Michael J Waring, J Michael Edwardson, Robert M Henderson; University of Cambridge, United Kingdom

Atomic force microscopy (AFM) has been used to examine the structural transitions in the tertiary structure of DNA induced by binding of ditercalinium, a DNA bis-intercalator with strong antitumor properties. AFM images of plasmid DNA of both circular and linear forms revealed an increase in the formation of supercoils and plectonemic coils caused by changes in superhelical stress upon bis-intercalation. A further investigation of the effects of bis-intercalation using 292 bp DNA fragments showed an increase in contour length with increasing ditercalinium concentration, reaching saturation at a drug concentration corresponding to interaction with every other available binding site. An analysis using angles measured between segments along the DNA molecules revealed that at this level of bis-intercalation, the DNA molecules were twice as rigid as naked DNA with persistence length increasing from ~50 nm to ~100 nm.