
Letter to the Editor

The Centers of Premeltons Signal the Beginning and Ends of Genes

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This paper begins by reviewing our crystallographic studies of planar intercalators complexed to a series of self-complementary DNA and RNA- like dinucleoside monophosphates done in earlier years. The results of these studies readily explain the observation of neighbor-exclusion -- that is -- why intercalation is limited to occur between every-other base-pair in DNA at high drug/DNA binding ratios. Neighbor-exclusion has been proposed to reflect the presence of an entirely different DNA conformational state in DNA – *this being called beta-DNA -- a key metastable and hyperflexible liquid-like phase that acts as a transition-state intermediate in DNA-melting and in the B- to A- structural phase-transition.*

The existence of this DNA form leads to a unifying conceptual theory, which predicts beta-DNA to arise spontaneously within the centers of entities called “premeltons” – serving to nucleate both DNA-melting and the B- to A- structural phase transition -- and further explaining how the intercalation of planar drugs and dyes happens -- how DNA breathing and DNA melting occur – and how the RNA polymerase binds to the promoter and is able to move frictionlessly along DNA as it synthesizes RNA and finally detaches from DNA to terminate transcription -- *this carrying the important prediction that the centers of premeltons define the beginning and ends of genes in both naked DNA and in DNA undergoing the transcription of genes in active chromatin.* For more details: https://www.youtube.com/watch?v=-MEMM_-kUWg

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