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Premeltons in DNA

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Letter to the Editor

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Letter to the editor concerning my recent article entitled, "PREMELTONS IN DNA".

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 phenomenon of neighbor-exclusion – that is – why intercalation is limited to occur between every other base-pair in DNA at high drug/DNA binding ratios.

This phenomenon is now understood to reflect the presence of an entirely different DNA conformational state in DNA – called beta-DNA – this being 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. Beta-DNA arises spontaneously within entities called premeltons – serving to nucleate both of the above.

Their presence in DNA explains how intercalation happens, how the process of DNA breathing and DNA melting occur, how the RNA polymerase binds to the promoter – subsequently being able to move along DNA as it synthesizes RNA – and how termination happens.