

Analytica-2015: Importance of the location and number of positive charge of periphery cationic ions of porphyrin bound to DNA- Min IkKwak- Yeungnam University

Min IkKwak

Yeungnam University, Republic of Korea

The binding modes of *o*-, *m*- and *p*-trans-BMPyP and DNA were investigated by using spectroscopy properties. We also compared the binding modes of the cationic porphyrin with the position and number of the periphery cationic methyl pyridine ions. When *o*-, *m*- and *p*-trans-BMP was bound to DNA, the absorption spectrum showed red shift and hypochromism compared with the absorption spectrum of DNA free cationic porphyrin and *m*-trans-BMP-DNA showed the greatest. In the case of *o*- and *p*-trans-BMP-DNA at all concentration ratios as a result of CD spectrum, positive and negative bisignate absorption bands in Soret region of porphyrin and two negative absorption bands of *m*-trans-BMP-DNA were observed. The results of the LDR spectra show that the Soret absorption band of porphyrin is small and that *m*- and *p*-trans-BMPyP-DNA has a positive absorption value when compared with the absorption band of the light absorbing region of DNA. Considering these various spectroscopic properties, *o*-, *m*- and *p*-trans-BMP are far from the insertion mode when they are bound to DNA. The comparison of the binding modes with TMPyP with 4 number of peripheral cationic methyl pyridine ions of cationic porphyrin showed that the position of the periphery cationic methyl pyridine ion is important but the number is the most important factor to be inserted into the DNA base pair. In other words, *o*-TMPyP in the case of TMPyP with 4 number of periphery cationic methyl pyridine ions of cationic porphyrin exhibits outside binding mode which interacts with DNA phosphate due to steric hindrance of periphery cationic methyl pyridine ion and *m*- and *p*-TMPyP was inserted into the DNA base pair. However, trans-BMPyP with the number of two cationic methyl-pyridine ions in cationic porphyrin was found to be an outside binding mode that interacted with DNA phosphate or to bind to the groove.

The after effects of looking at the coupling methods of TMPyP having four outskirts cationic methylpyridine particles of cationic porphyrin showed that paying little heed to the quantity of fringe cationic methylpyridine particles of cationic porphyrin, on account of the ortho-position, non planarity due to steric obstacle of the fringe cationic methylpyridine particles introduced outside or groove-restricting modes characteristic of

collaboration with DNA phosphates. Not at all like the ortho-position, the para-position introduced distinctive restricting modes dependent on the quantity of fringe cationic methylpyridine particles. Just cationic porphyrins having four fringe cationic methylpyridine particles were embedded into the DNA. In conclusion, paying little heed to the quantity of fringe cationic methylpyridine particles, all meta-positions were embedded into the DNA. This showed in any event the area and the quantity of fringe cationic methylpyridine particles of the porphyrins utilized in this analysis were significant components that decide addition into DNA base sets. The coupling methods of different cationic porphyrins to DNA in a watery arrangement and under the sub-atomic swarming condition incited by poly(ethylene glycol) (PEG) were looked at by typical assimilation, round dichroism (CD), and straight dichroism (LD) spectroscopy procedures. Enormous negative CD and LD flags in the Soret retention locales of the meta- and para-TMPyP [meso-tetrakis (n-N-methylpyridiniumyl) porphyrin (meta, n = 3) and (para, n = 4)] were clear in the watery arrangement, showing an intercalative-restricting mode, while a positive CD range and a less exceptional negative LD range for the ortho-TMPyP (n = 2)- complexed DNA recommended a significant score restricting mode. These coupling modes are held under an atomic swarming condition, proposing that the PEG bunch can't get to the TMPyPs that are intercalated between the DNA base sets or that dilemma at the significant furrow. The ghostly properties of the ortho-, meta-, and para-trans-BMPyP [trans-bis(N-methylpyridinium-n-yl)diphenyl porphyrin, n = 2,3,4]-bound DNA in a fluid arrangement compare to neither the intercalative-restricting nor the section restricting mode, which is interestingly with the TMPyP cases..

Biography

Min IkKwak has completed his graduation and is currently pursuing Postgraduate studies from Yeungnam University majoring in Biophysical Chemistry.

Email: ad471v@naver.com