Sanguinarine. Mecanismos de ação anticâncer das benzofenantridinas

Polymorphic nucleic Acid binding of bioactive isoquinoline alkaloids and their role in cancer.

Maiti M, Kumar GS.

J Nucleic Acids. 2010;2010. pii: 593408.

Source

Biophysical Chemistry Laboratory, Indian Institute of Chemical Biology (CSIR), Kolkata 700032, India.

Abstract

Bioactive alkaloids occupy an important position in applied chemistry and play an indispensable role in medicinal chemistry. Amongst them, isoquinoline alkaloids like berberine, palmatine and coralyne of protoberberine group, sanguinarine of the benzophenanthridine group, and their derivatives represent an important class of molecules for their broad range of clinical and pharmacological utility. In view of their extensive occurrence in various plant species and significantly low toxicities, prospective development and use of these alkaloids as effective anticancer agents are matters of great current interest. This review has focused on the interaction of these alkaloids with polymorphic nucleic acid structures (B-form, A-form, Z-form, H(L)-form, triple helical form, quadruplex form) and their topoisomerase inhibitory activity reported by several research groups using various biophysical techniques like spectrophotometry, spectrofluorimetry, thermal melting, circular dichroism, NMR spectroscopy, electrospray ionization mass spectroscopy, viscosity, isothermal titration calorimetry, differential scanning calorimetry, molecular modeling studies, and so forth, to elucidate their mode and mechanism of action for structure-activity relationships. The DNA binding of the planar sanguinarine and coralyne are found to be stronger and thermodynamically more favoured compared to the buckled structure of berberine and palmatine and correlate well with the intercalative mechanism of sanguinarine and coralyne and the partial intercalation by berberine and palmatine. Nucleic acid binding properties are also interpreted in relation to their anticancer activity.

PMID:

20814427