

QUATERNARY PROTOBERBERINE ALKALOIDS AND THEIR INTERACTION TO DNA

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Non-canonical DNA secondary structures have gained interest in recent years. One of these structures is the G-quadruplex (GQ) which is present in several protoncogenic-DNA promoters and thus participates in biological processes such as replication, transcription and translation. Quaternary protoberberine and tetrahydroprotoberberine alkaloids (corysamine, coptisine and stylopine), which are supposed to selectively bind these structures, have been tested. Influence of selected alkaloids on stability of double-stranded DNA and noncanonical form of DNA was observed by determining association constants of alkaloid-DNA complexes using two spectroscopic methods – molecular absorption spectrometry and fluorescence spectrometry. Furthermore, effect of given alkaloids on melting temperature of these DNA structures was determined by using CD spectrometry. Competitive dialysis was performed for affinity comparison of certain alkaloids to different DNA structures including G-quadruplexes. These measurements have confirmed results obtained by CD spectrometry and extended the knowledge, that investigated alkaloids prefer interaction with G-quadruplexes in comparison to dsDNA and ssDNA.

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