

Electrochemical and spectroscopic studies on the interaction of europium-(9-acridine carboxylate)₂ complex with calf thymus DNA

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A new europium-acridine-9-carboxylate (Eu(III)-(9-ACA)₂(NO₃)) was synthesized and characterized. The interaction of calf thymus DNA (ct-DNA) with Eu(III)-(9-ACA)₂(NO₃) has been investigated using UV-visible and fluorescence spectroscopic and electrochemical techniques including cyclic voltammetry and differential pulse voltammetry (DPV) on the GCE. UV-absorption spectroscopic techniques were employed to investigate the interaction between the Eu(III)-(9-ACA)₂(NO₃) and ct-DNA. Based on electrochemical and spectroscopic data, the mode of binding of Eu(III)-(9-ACA)₂(NO₃) to DNA through intercalation interaction was concluded. The stoichiometric coefficient (n) and apparent binding constant (β) were calculated to be 1.4 and 9.1 x 10⁴ M⁻¹, respectively. The antitumor activity of the complex against MDA-MB-231 (mammary cancer) and PC-3 (prostate carcinoma) cell lines was evaluated and the results showed promising activities.

Keywords: Europium-(9-acridine carboxylate)₂; DNA interaction; voltammetry; Absorption and fluorescence spectra; Anti-tumor activities.

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