**Title:** Probing of the Interaction Between Human Serum Albumin and A New Synthesized Pd(II) Complex Using Spectroscopic methods

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**Abstract:** Human serum albumin (HSA) is an abundant, multifunctional and nonglycosylated, negatively charged plasma protein, with ascribed ligand-binding and transport properties, antioxidant functions, and enzymatic activities. In the present study, the interaction and side effects of a new designed anti cancer compound (1,10-phenanthroline butyl dithiocarbamato palladium(II) nitrate) on HSA have been investigated by different spectroscopic (UV-visible, fluorescence and circular dichroism (CD)) techniques at two temperatures of 25 and 37°C. By the analysis of fluorescence spectra, it was observed that this complex has an ability to quench the intrinsic fluorescence of HSA through a static quenching procedure. The number of binding sites and the association binding constants of Pd(II) complex were calculated at 25 and 37°C. Also, the negative $\Delta H^\circ$ and positive $\Delta S^\circ$ values resulted interaction of Pd(II) complex, using the vant’s Hoff equation, showed that the electrostatic interaction has a major role in the binding process. The quantitative analysis of CD spectra represented that Pd(II) complex induces significantly alterations in the secondary structure of protein via decreasing in the content of $\alpha$ helical structure of the protein. Our results suggest that the new synthesized Pd(II) complex can bind to blood carrier protein of HSA and change the tertiary and secondary structure of the protein, which may be considered as side effects of this new synthesized drug.

**Presentation:** Poster