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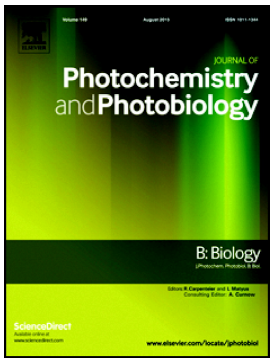

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Biological potential of oxo-vanadium salicylediene amino-acid complexes as cytotoxic, antimicrobial, antioxidant and DNA interaction

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ABSTRACT

New series of oxo-vanadium *N*-salicyledieneamino acid Schiff base complexes are synthesized and characterized. They are synthesized from the reaction of sodium salicylaldehyde-5-sulfonate, some amino acids, alanine (VOHL1), leucine (VOHL2) or glycine (VOHL3) in an aqueous media, and leucine (VOHLpy1) or tryptophan (VOHLpy2) in pyridine with vanadyl acetylacentonate. The complexes are characterized by EA, TGA, IR, UV-Visible and mass spectra, conductivity and magnetic measurements. The biological activity of the VO-complexes shows that VOHL1, VOHL2 and VOHL3 exhibit anti-proliferative effect and may be used as anticancer drugs. All VO-complexes manifest high toxicity, except VOHL2 is less toxic and could be applied for the human being. VOHL1, VOHL2 and VOHL3 display a remarkable SOD like potential and act as high inhibiting reagents. VOHLpy1 and VOHLpy2 show low inhibiting potentials. All VO-complexes have good anti-oxidant effect, in which VOHL3 affords the best antioxidant activity. The interaction between VO-complexes and DNA is studied spectrophotometrically and by gel electrophoresis. Binding constants and spectrophotometric parameters indicate a strong interaction between VO-complexes and DNA. All VO-complexes have respectable anti–bacterial and antifungal activities, where VOHL3 shows the maximum potential. DFT calculations of VOHL1 and VOHL3 were discussed in the light of their biological activity, which are convenient with the obtained results.

Keywords: oxo-vanadium, Schiff base, amino acids, DNA, antioxidant, antibacterial, antifungal, DFT calculations.

1. Introduction