

Versatility in the biological behavior of two aminobenzoate oxidovanadium (V, IV) compounds. Inhibition or simulation of enzymes

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The pharmacological potential of vanadium compounds is of great interest to researchers in treatments of various diseases (diabetes, cancer, tropical endemic diseases, etc.) [1,2]. On the basis of the potential biological/pharmacological applications, in this work we have synthesized and physico-chemically characterized, two new complexes containing vanadium (IV) and (V) with 4-aminobenzoic acid as the ligand (L). The experimental results obtained (elemental analysis, FTIR, diffuse reflectance and UV-vis spectroscopy, EPR and ¹HNMR) as well as the theoretical calculations (DFT) performed allowed us to determine the following stoichiometries [VO(O₂)LH₂O].H₂O (**1**) and *cis*-[VOL₂H₂O] (**2**). The inhibitory effects on acid phosphatases (AcP) and alkaline phosphatases (ALP) were determined. The complexes demonstrated specific activities: (**2**) better inhibitor of AcP (IC₅₀ = 250 μM), (**1**) higher inhibition on ALP (IC₅₀ = 500 μM). The pro-oxidant, antioxidant and anti-leishmaniasis activities were also studied. Only (**1**) catalyzes the oxidation of dihydrorhodamine (DHR) but none of them manifests activity against *L. amazonensis promastigotes*. Both complexes catalyzed the dismutation of superoxide (IC₅₀(**1**) = 114.0 μM, k_{MCF} = 1.6 x 10⁵ M⁻¹.s⁻¹, IC₅₀(**2**) = 155.0 μM, k_{MCF} = 1.1x10⁵ M⁻¹.s⁻¹), showing a moderate effect and also mimicked peroxidase activity (phenol red, (**1**) V_{max} = 8.34 x 10⁻⁵ min⁻¹, K_m = 3.29 x 10⁻⁴ M, k_{cat} = 3.48 min⁻¹, k_{cat}/K_m=10577.5 M⁻¹.min⁻¹; (**2**) V_{max} = 3.44 x 10⁻⁵ M.min⁻¹, K_m=1.35x10⁻⁴ M, k_{cat}=1.43 min⁻¹, k_{cat}/K_m = 10592.6 M⁻¹.min⁻¹). Interaction with albumin will also be discussed. Both complexes resulted with potential pharmacological activities in some of the aspects studied.

[1] D. Rehder, Future Med. Chem, 0.4155/fmc.15.187.

[2] D. Wischang, O. Brücher, J. Hartung, Coord. Chem. Rev. 255 (2011) 2204-2217.