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Interaction of water-soluble Sb(V)-porphyrins and their free ligands with DNA

Luís Augusto Silveira Horsth, Beatriz Maia Pedrosa, Cláudio Eduardo Moreira de Souza and Gilson DeFreitas-Silva

Departamento de Química do ICEx, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil
E-mail: luisaugustosh.ls@gmail.com

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Nowadays, the most accessible cancer treatments are too damaging to the patient's body, so, researches into milder and equally functional therapies are increasingly needed. In this context, porphyrins are attractive candidates for fighting this disease via photodynamic therapy, because they are capable of being photosensitizers [1]. Therefore, understanding how these compounds interact with biomolecules is indispensable for the development of new medicines.

The study of interaction with DNA is being made on the following water-soluble porphyrins and their respective free-bases: $[Sb^{V}Cl_2(T3PyP)]^{+}$; $[Sb^{V}Cl_2(T3EPyP)]^{5+}/H_2T3EPyP^{4+}$; $[Sb^{V}Cl_2(TCPP)]/H_2TCPP$ (Figure a). The interaction assays were performed by UV-VIS absorption spectroscopy, adding a DNA solution to a porphyrin solution (both made in PBS buffer), at 37 °C, and registering the changes, having as parameter of analysis the Intrinsic Binding Constant (K_b), dealt by the Equation of Scatchard[1].

The only porphyrinic compound that accused interaction through UV-VIS was $H_2T3EPyP^{4+}$ (Figure b), and according to the observed changes on the Soret band, there was a hypochromicity of 30,72% and a blue shift of 10 nm, that leads in the direction of a K_b next to 10^3 M^{-1}, pointing to nonspecific electrostatic interactions [1].

Furthermore, circular dichroism will still be applied to all these porphyrins to determine the type of binding, when it occurs, after all, interactions involving the minor groove may go unnoticed on the UV-VIS spectrophotometric titration method [2].

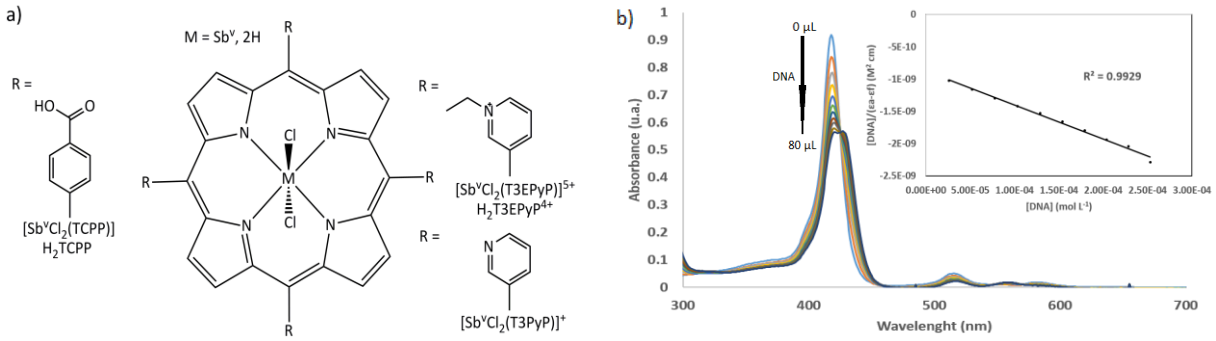

Figure: (a) Structure of the tested porphyrins and (b) $H_2T3EPyPCl_4$ UV-VIS spectrum beneath its K_b analysis graph.

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References

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