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New Water-Soluble Antimony Porphyrin and Its Use Against Different Cancer Cell Lines

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Tetrapyrrole-derived macrocycles are commonly found in the human body, including porphyrins, which can be used as a powerful photosensitizing agent[1], they can become a complex with metals/metalloids and each of them has unique proprieties. The metalloid chosen is Antimony, historically used in medicine against leishmaniasis[2]. One treatment that has usual porphyrin usage is photodynamic therapy (PDT)[3], an alternative to harmful cancer treatments because it is expected that the PDT agent, gather preferably in cancerous cells. The focus of this work is to synthesize a new antimony-based porphyrin, characterize and test it as a possible PDT agent.

The synthesis of the porphyrin macrocycle, known as H_2TCMPP, was carried out using pyrrole and methyl 4-formylbenzoate, refluxed in a mixture of propionic acid/nitrobenzene[4]. To react this free base with the Sb(V) cation, H_2TCMPP was dissolved in dichloromethane with 2,4,6-Collidine in a reflux system and $SbCl_5$ was added[5]. The product of this reaction is [$SbCl_2$(TCMPP)]Cl. The hydrolysis, was carried out with dissolution of the antimony complex in tetrahydrofuran and NaOH, was magnetically stirred, precipitated with acid and filtered[4]. The precipitate was [$SbCl_2$(TCPP)] (Figure 1A).

This new water-soluble Sb-porphyrin was characterized by mass spectrometry (MALDI-TOF – Figure 1B), elemental analysis (CHN) and ultraviolet-visible spectroscopy (UV-VIS). The results of these analyses indicated the obtaining of the complex. A preliminary study with MEC-1 (chronic B cell leukemia) cell line has been initiated; all the results are going to be showed at the congress.

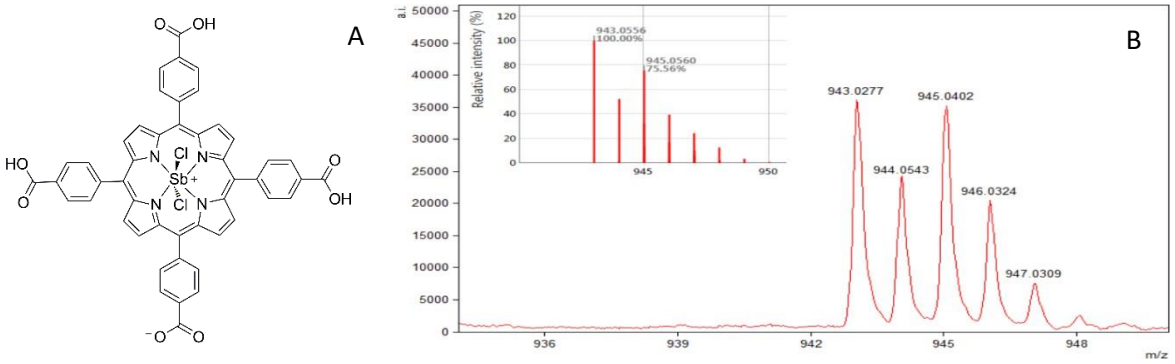

Figure: A - Structure of the complex [$SbCl_2$(TCPP)] and B - Mass spectrum of the complex (MALDI-TOF).

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