

2-Thiocyanil-1,4-Naphthoquinone's: a new drug with trypanocidal activity that selectively impairs the viability and growth at all stages of the *Trypanosoma cruzi* life cycle.

Maciel, I.O.¹; Chain, M.O.¹; Silva, R.S.F.²; De Melo, L.D.B.¹

¹Laboratório de Genética Molecular, Dep. Biotecnologia, Instituto Federal de Educação, Ciência e Tecnologia, Rio de Janeiro, Brasil;

²Núcleo de Ciências Químicas, Instituto Federal de Educação, Ciência e Tecnologia, Rio de Janeiro, Brasil.

Introduction and Objectives: Chagas disease is a debilitate disease and it still does not have an effective cure at the chronicle stage. Benznidazole is the most common medicament used, but it's effect only in acute stage, and new therapeutic alternatives are needed to guarantee a better life quality and cure for the patients in chronicle stage. In this context, some analogues of 1,4 naphthoquinones, such as Lapachol and 2-Bromo-1,4-Naphthoquinone, 2-Hydroxy-1,4-naphthoquinone (Lawzone) have been already proposed as trypanocidal drugs, with different levels of efficacy *in vitro* trials. Recently, our group synthetised a new sulphur compound, the 2-Thiocyanil-1,4-Naphthoquinone. Our goal in this study was to determine the trypanocidal activity of this compound *in vitro* and *in vivo* assay. **Materials and methods:** Cell proliferation (epimastigotes) and cell viability (culture trypomastigotes) were determined after incubation with Lapachol, Lawzone, 2-Bromo-1,4-Naphthoquinone e 2-Thiocyanil-1,4-Naphthoquinone at different concentrations. The periodical counts were performed in a flow cytometer (BD Accuri™ C6) after 24 hours for trypomastigotes and 24, 48, 72 and 96 hours for epimastigotes, with concomitant incubation with stain cell stability 7-AAD (7-aminoactinomycin D). Moreover, the effective concentrations (EC50) and inhibitory concentration (IC50) were also evaluated for epimastigotes forms and mammalian cell lineage by MTT assays. Experiments *in vivo* with C57BL/6J mice were performed with 2-Thyocianil-1,4-Naphthoquinone, in order to verify the toxicity of this compound in rodents. **Results and conclusions:** Results of assays performed in epimastigotes indicated trypanocidal effect only for 2-Thiocyanil-1,4-Naphthoquinone. Considerable differences in IC50 between parasites and mammalian cell were observed, and suggest a promising selectivity of this drug. Initials results with mice didn't show toxicity of the 2-Thyocianil-1,4-Naphthoquinone, but enzymatic analysis will be performed to obtain a better analysis. Soon we will investigate whether the drug can inhibit the *in vitro* infection, which could put 2-Thiocyanil-1,4-naphthoquinone as promising candidate for chemotherapy in experimental Chagas' disease.

Keywords: trypanocidal drugs, naphthoquinones, Chagas's disease.

Supported by: CNPq-SETEC, IFRJ-Programa PIBICT/Prociência.