

## **Anti-parasitic Effect On *Toxoplasma gondii* Induced By BnSp-7, Lys49-Phospholipase A<sub>2</sub> Homologue From *Bothrops pauloensis* Venom**

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**INTRODUCTION:** Toxoplasmosis affects a third of the global population. Its great relevance in public health has led to a search for new therapeutic approaches. **OBJECTIVE:** Herein, we report the antiparasitic effects of BnSP-7 toxin, a Lys49 phospholipase A<sub>2</sub> homologue from *Bothrops pauloensis* snake venom, on *Toxoplasma gondii*. **MATERIAL AND METHODS:** To verify its viability, tachyzoites were treated with BnSP-7 and dyed by trypan blue. To perform adhesion assays, HeLa cells were treated with BnSP-7 during 1 or 24 h, and after this time, the cells were infected with untreated parasites. In a second step, only tachyzoites were treated with BnSP-7 for posterior infection in HeLa cells. To perform proliferation assay, HeLa cells were cultured in RPMI. After, the supernatant was discarded and RPMI or *T. gondii* tachyzoites treated with BnSP-7, 1.5 x 10<sup>5</sup> parasites/200µL/well, were added and incubated for 24 h. The IL-6, MIF and TNF-α cytokines were measured by ELISA. **RESULTS AND DISCUSSION** BnSP-7 presented significant cytotoxicity against host HeLa cells at higher doses (200 µg/mL to 50 µg/mL), whereas lower doses (25 µg/mL to 1.56 µg/mL) produced low cytotoxicity. Furthermore, the toxin showed no effect on *T. gondii* tachyzoite viability when evaluated by trypan blue exclusion, but decreased both adhesion and parasite proliferation when tachyzoites were treated before infection. We also performed cytokine measurements from supernatants collected from HeLa cells infected with *T. gondii* tachyzoites previously treated with RPMI or BnSP-7, which revealed enhancement of only MIF and IL-6 cytokines levels on supernatants of HeLa cells after BnSP-7 treatment. Our results showed that the BnSP-7 exerts an anti-*Toxoplasma* effect at a lower dose than that required to induce cytotoxicity in HeLa cells, and also modulates the immune response of host cells. **CONCLUSION:** These data suggest that the BnSP-7 toxin is an important tool for the discovery of new parasite targets that can be exploited for toxoplasmosis treatment.

**Keywords:** *Bothrops pauloensis*; Phospholipase A<sub>2</sub>, Snake venom, *Toxoplasma gondii*.

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