Ecto-phosphatase Activities from *T. rangeli* and its Possible Relationship with Parasite Life Cycle

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Membrane-bound ecto-phosphatases have been characterized in several members of the Trypanosomatidae family, such as *Leishmania amazonensis*, *Trypanosoma brucei*, *Trypanosoma cruzi* and *Trypanosoma rangeli*. Recently, we demonstrated that *T. rangeli* living parasites were able to hydrolyze the artificial substrates for phosphatases p-nitrophenylphosphate (p-NPP) and β-glycerophosphate (β-GP). This work proposes the investigation of the kinetics modulatory differences between ecto-phosphatase activities from *T. rangeli*, using p-NPP and β-GP as substrates. We observed that optimum pH for p-NPP hydrolysis lies on the acid range, while optimum pH for β-GP hydrolysis lies on the alkaline range. Corroborating these results, these ecto-phosphatase activities presented different sensitivity to the phosphatases inhibitors sodium orthovanadate (acid phosphatase inhibitor) and levamisole (alkaline phosphatase inhibitor). Orthovanadate, 0.4 mM, inhibited 70.5% of the p-NPP hydrolysis and 24.0% of β-GP hydrolysis while levamisole, 0.1 mM, inhibited 3.3% of the p-NPP hydrolysis and 50.9% of β-GP hydrolysis. In addition, the preincubation of the living parasites with 0.1 U phospholipase C for 60 minutes showed that only β-GP hydrolysis was sensitive to this treatment, decreasing the ecto-phosphatase activity. These activities also showed different profile during the proliferation of *T. rangeli in vitro*. We also investigated the physiological role of these ecto-phosphatase activities from *T. rangeli.* We observed that levamisole was able to inhibit the in vitro proliferation of *T. rangeli* while orthovanadate was able to inhibit the in vitro differentiation of this parasite. These results suggest that the p-NPP and β-GP hydrolysis could be catalyzed by different ecto-phosphatase activities from *T. rangeli* and these enzymes could be involved in different stages of *T. rangeli* life cycle.
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