Bioenergetics Changes upon Two Strains of *Trypanosoma cruzi* epimastigotes Faced to Hypoxic Conditions

Saraiva FMS[1], Laranja GAT[1], Nogueira NPA[1], Paes MC[1,2]

[1] Instituto de Biologia Roberto Alcântara Gomes - Departamento de Bioquímica – Universidade do Estado do Rio de Janeiro – RJ - Brasil.
[2] Instituto Nacional de Ciência e Tecnologia - Entomologia molecular (INCT-EM) - Brasil

INTRODUCTION: During its life cycle *Trypanosoma cruzi* is faced to different environments such as changes in oxygen levels that challenge parasite to divert it metabolic activity. It is well recognized this parasite present multiplicity of its genotypes and phenotypes, thus metabolic responses may vary along parasite strains. **OBJECTIVES**: Therefore, we compared the response to hypoxic conditions between two strains (CL Brener and Y strain) of *T. cruzi* epimastigotes and investigated mitochondrial respiration differences between these parasites. **MATERIAL AND METHODS**: Hypoxic condition was induced by N_2 saturation atmosphere and parasites were cultured in hypoxia or normoxia for five days. Epimastigotes growth were quantified using a Neubauer chamber. We used the probe DCFDA to evaluate epimastigotes ROS production. To compare parasites O_2 consumption we performed a high resolution respirometry using a substrate-uncuppler-inhibitor-tritation protocol in digitonin-permeabilized cells. **RESULTS AND DISCUSSION**: Our results showed hypoxia induced epimastigotes proliferation and Y strain parasites proliferates more than CL Brener epimastigotes. Besides, in both strains hypoxic condition induced ROS production. In order, to investigate the energetic metabolism variances between both strains, we performed a high resolution respirometry assay. Oxygen consumption measurements indicated that Y strain cells presented higher RCR values than CL brener parasites. Moreover, proton leak values were higher in CL Brener cells, indicating that respiration in this cells is more uncoupled. In agreement with this result, Y strain parasites also demonstrated an increase in ETS capacity in relation to CL Brener epimastigotes. These results suggests that Y strain parasites uses respiration process to ATP production more than CL Brener epimastigotes, that probably produces more ATP out of mitochondria than Y strain. **CONCLUSIONS**: Taken together, our results suggest some difference in mitochondrial respiration between both *T. cruzi* epimastigotes strains that may support the mild variances on response of this parasites to hypoxia challenge.

Key words: bioenergetics response, hypoxia and *Trypanosoma cruzi*.
Supported by CNPq, FAPERJ and INCT-EM.