Ecto-Phosphatase Activities on the Cell Surface of the Amastigote Forms of *Trypanosoma cruzi*

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Live *Trypanosoma cruzi* amastigotes hydrolyzed *p*-nitrophenylphosphate (PNPP), phospho-amino-acids and ^{32}P-casein under physiologically appropriate conditions. PNPP was hydrolysed at a rate of 80 nmol·mg^{-1}·h^{-1} in the presence of 5 mM $MgCl_2$, pH 7.2 at 30 °C. In the absence of Mg^{2+} the activity was reduced 40% and we call this basal activity. At saturating concentration of PNPP, half-maximal PNPP hydrolysis was obtained with 0.22 mM $MgCl_2$. Ca^{2+} had no effect on the basal activity, could not substitute Mg^{2+} as an activator and in contrast inhibited the PNPP hydrolysis stimulated by Mg^{2+} (I_{50} = 0.43 mM). In the absence of Mg^{2+} (basal activity) the stimulating half concentration ($S_{0.5}$) for PNPP was 1.57 mM, while at saturating $MgCl_2$ concentrations the corresponding $S_{0.5}$ for PNPP for Mg^{2+}-stimulated phosphatase activity (difference between total minus basal phosphatase activity) was 0.99 mM. The Mg-dependent PNPP hydrolysis was strongly inhibited by sodium fluoride (NaF), vanadate and Zn^{2+} but not by tartrate and levamizole. The Mg-independent basal phosphatase activity was insensitive to tartrate, levamizole as well NaF and less inhibited by vanadate and Zn^{2+}. Intact amastigotes were also able to hydrolyse phosphoserine, phosphothreonine and phosphotyrosine but only the phosphotyrosine hydrolysis was stimulated by $MgCl_2$ and inhibited by $CaCl_2$ and phosphotyrosine was a competitive inhibitor of the PNPP hydrolysis stimulated by Mg^{2+}. The cells were also able to hydrolyse ^{32}P-casein phosphorylated on serine and threonine residues but only in the presence of $MgCl_2$. These results indicate that in the amastigote form of *T. cruzi* there are at least two ectophosphatase activities, one of which is Mg^{2+} dependent and can dephosphorylate phospho-aminoacids and phosphoproteins under physiological conditions.