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B - - Inorganic phosphate transport in Giardia duodenalis

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INTRODUCTION

*Giardia duodenalis* is a flagellate protozoan that infects the small intestine of vertebrates, the most common cause of epidemics diarrhea in the world. The infection begins by cysts ingestion, followed by excystation and colonization of the small intestine by trophozoites, which are responsible for the clinical manifestation of the disease. One important environmental change is availability of nutrients, as inorganic phosphate (P_i). P_i is an extremely important nutrient in the cellular metabolism and it is required for the synthesis of DNA, RNA, lipids, sugars and proteins; in addition, P_i is involved in biochemical reactions transfer of phosphoryl grouping.

OBJECTIVES
The aim of this work is characterize biochemically the $P_i$ transport in *G. duodenalis*, investigating the kinetics characteristics of $P_i$ transport, as time course, cell density, pH and the substrate affinity of the $P_i$ transporter.

MATERIALS AND METHODS

It was used the trophozoite form to accomplish the quantification of $P_i$ transport in *G. duodenalis*. The $P_i$ transport was measured by the $^{32}$P$ _i$ uptake: the cells were incubated at room temperature for 15 minutes in a reaction mixture containing 140 mM choline chloride, 5 mM KCl, 1.5 mM CaCl$_2$, 1 mM MgCl$_2$, 10 mM HEPES (pH 7.2), 0.1 mM KH$_2$PO$_4$, 2.5 μCi/nmol $^{32}$Pi.

DISCUSSION AND RESULTS

This $P_i$ transport is linear with time and cell density, but it isn't modulated by different pH values, suggesting that $P_i$ transporter has no preference by $P_i$ in the monovalent or divalent form. This phosphate transport was inhibited by SCH28080 (H$^+$.K$^+$.ATPase inhibitor), bafilomycin A$_1$ (H$^+$.ATPase inhibitor) and FCCP (proton ionophore) indicating that the proton gradient across the plasma membrane is important for the transporter activity.

CONCLUSION

The $P_i$ transport in *G. duodenalis* is linear with time and the cell density but isn't modulated by pH. The $P_i$ transporter is high affinity and is $P_i$.H$^+$ simporter.

Keywords: Pi, giardia, biochemically

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