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Molecular characterization of a protein geranylgeranyltransferase type II and a Rab escort protein from *Entamoeba histolytica*

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Rab proteins function as molecular switches of signal transduction for intracellular vesicular transport. For Rab proteins to function, they must be post-translationally geranylgeranylated and attach to an intracellular membrane. Protein geranylgeranyltransferase type II (GGT-II) catalyzes this modification with the aid of a Rab escort protein (REP). We have been studying the prenyltransferases of *Entamoeba histolytica* (*Eh*), an enteric protozoan parasite of humans, in their biological similarity and differences as well as the feasibility of using them as a target for chemotherapy.We report here on their GGT-II and REP. The alpha (GGT-IIα) and beta (GGT-IIβ) subunits and REP from *Eh* consist of 317, 315 and 480 amino acid residues, respectively, and have characteristic conserved domains. These proteins are phylogenetically independent of those from other organisms. Recombinant GGT-II expressed in *Escherichia coli* was purified as a complex of both subunits. An anti-*Eh* GGT-IIα and an anti-*Eh* REP rabbit serum did not react with rat GGT-IIα and rat REP, respectively. REP-dependent geranylgeranylation of Rab by recombinant *Eh* GGT-II was confirmed using [^{3}H] geranylgeranyl pyrophosphates. There was a difference in substrate specificity between amoebic GGT-II and rat GGT-II. In conclusion, GGT-II and REP from *Eh* are very different from those of mammals in phylogeny, antigenicity and substrate specificity.