Trichomonas vaginalis is a flagellated microaerophilic protozoan from the group Excavata that cause trichomoniasis, the most common nonviral sexually transmitted disease in the world. This thesis deals with the study of hydrogenases, enzymes catalyzing reversible conversion of protons and electrons to molecular hydrogen. In T. vaginalis, hydrogenases have been identified so far only in hydrogenosomes, modified anaerobic mitochondria that are involved in energy metabolism. We proved the presence of this enzyme also in the cytosol of T. vaginalis. Among several hydrogenase paralogues present in the genome, we selected an appropriate gene for the putative cytosolic hydrogenase (C-Hyd) and verified its cytosolic localization in the cells with overexpressed C-Hyd protein. Based on the determination of hydrogenase activities in different cell compartments and fractions obtained by affinity chromatography, we demonstrated the hydrogenase activity of C-Hyd protein, which means that C-Hyd is a functional hydrogenase. Identification of hydrogenase in T. vaginalis cytosol changes our understanding of trichomonad core metabolism and opens the door for the research of unexplored metabolic capabilities of this parasite.