New therapeutic targets for drug design against Trypanosoma cruzi, advances and perspectives.

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Abstract

Chagas disease is one of the most important parasitic diseases in Latin America, affecting 16 to 18 million people. Nifurtimox and Benznidazol are drugs that are commonly used in its treatment; however, these drugs produce several adverse reactions and are not effective in the chronic phase of the disease. Therefore, the design, synthesis, and biological evaluation of new compounds with potential activity against Trypanozoma cruzi are of great importance. We review six proteins involved in the biochemical metabolism of Trypanosoma cruzi that have recently been studied as potential targets for designing new drugs for Chagas disease. These are farnesyl pyrophosphate synthase, trans-sialidase, cruzain cystein protease, trypanothione reductase, glucose 6-phosphate-dehydrogenase, glyceraldehyde 3-phosphate-dehydrogenase, and alpha-hydroxy acid dehydrogenase. We also review the advances of compounds recently designed based on structure-activity, and the perspectives of new compounds that inhibit these therapeutic targets.