Current treatment and drug discovery against Leishmania spp. and Plasmodium spp.: a review.

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Source

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Abstract

Malaria and leishmaniasis are the most prevalent tropical diseases caused by protozoan parasites. Half of world's population is at risk of malaria and more than 2 million of new cases of leishmaniasis occur annually. There are no vaccines available for these diseases and current treatments suffer from several limitations. Therefore, novel drugs for malaria and leishmaniasis are much-needed. This article reviews the agents currently in use for treatment of these diseases, their known mechanisms of action and weaknesses. We present an overview of the main strategies for drug discovery and the relevance of these parasites genomics/proteomics data for a rational search of molecular targets and matching leads. In this direction, we emphasize the importance of the highly integrated partnerships and networks between scientists in academic institutions and industry involving several countries that promise to increase the chances of success and enhance cost-effectiveness in drug discovery against these parasitic diseases. In addition, we approach the available assays for testing lead compounds in large scale and their limitations for they represent one of the bottlenecks in the pipeline for novel drug discovery. We conclude the article presenting a recent coordinated initiative (TDR Transfection Network) established to overcome some of these limitations by the generation of Plasmodium and Leishmania transgenic parasites better suited for HTS platforms.