

# Recent Developments in Rationally Designed Multitarget Antiprotozoan Agents

## **Abstract:**

Protozoan infections are the leading causes of morbidity and mortality among parasitic infections of humans, accounting for approximately 800 thousand mortalities and a loss of more than 30 million disability-adjusted life years annually. The major protozoan infections of humans, namely malaria, Chagas disease, human African trypanosomiasis, and leishmaniasis, are primarily centered in the tropics, with a reach into some subtropical regions of the world. Though globally massive in their impact, these diseases mostly afflict the least economically endowed and geographically marginalized populations in low-income countries. As such, there is no sufficient market incentive for industrial business-driven antiprotozoal drug discovery due to poor marketing prospects and low returns on investment. Consequently, the pharmacopoeia for majority of these diseases, composed mainly of agents with poor efficacy and unsatisfactory safety profiles, has essentially remained unchanged for decades, creating a compelling need for more efficacious and better tolerated medicines. The policy makers and the scientific community are seeking effective ways to meet this need. So far, two approaches have emerged promising in this regard: combination chemotherapy and drug repositioning. Molecular hybridization has been cited as a potential third approach that could be used to deliver new antiprotozoal chemical entities. In this review article, recent applications of this novel strategy in antimalarial, antichagasic, antitrypanosomal, and antileishmanial drug discovery research and development over the last five years will be presented and discussed