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Triazenes: Unearthing Their Hidden Arsenal Against Malaria and Microbial Menace

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Abstract : Malaria and antimicrobial infections remain significant global health concerns, necessitating the continuous search for novel therapeutic approaches. This abstract presents an overview of the potential use of triazenes as effective agents against malaria and various antimicrobial pathogens. Triazenes are a class of compounds characterized by a linear arrangement of three nitrogen atoms, rendering them structurally distinct from their cyclic counterparts. This study investigates the efficacy of triazenes against malaria and explores their antimicrobial activity. Preliminary results revealed significant antimalarial activity of the triazenes, as evidenced by in vitro screening against P. falciparum, the causative agent of malaria. Furthermore, the compounds exhibited broad-spectrum antimicrobial activity, indicating their potential as effective antimicrobial agents. These compounds have shown inhibitory effects on various essential enzymes and processes involved in parasite survival, replication, and transmission. The mechanism of action of triazenes against malaria involves interactions with critical molecular targets, such as enzymes involved in the parasite's metabolic pathways and proteins responsible for host cell invasion. The antimicrobial activity of the triazenes against bacteria and fungi was investigated through disc diffusion screening. The antimicrobial efficacy of triazenes has been observed against both Gram-positive and Gram-negative bacteria, as well as multidrug-resistant strains, making them potential candidates for combating drug-resistant infections. Furthermore, triazenes possess favourable physicochemical properties, such as good stability, solubility, and low toxicity, which are essential for drug development. The structural versatility of triazenes allows for the modification of their chemical composition to enhance their potency, selectivity, and pharmacokinetic properties. These modifications can be tailored to target specific pathogens, increasing the potential for personalized treatment strategies. In conclusion, this study highlights the potential of triazenes as promising candidates for the development of novel antimalarial and antimicrobial therapeutics. Further investigations are necessary to determine the structure-activity relationships and optimize the pharmacological properties of these compounds. The results warrant additional research, including MIC studies, to further explore the antimicrobial activity of the triazenes. Ultimately, these findings contribute to the development of more effective strategies for combating malaria and microbial infections.

Keywords : malaria, anti-microbials, triazene, resistance
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