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Review

Role of Triazoles in the Field of Tuberculosis Treatment: Synthetic Approaches and Biological Investigation

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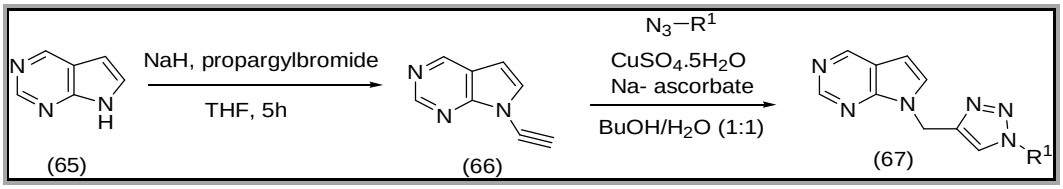
ABSTRACT

Tuberculosis, a major public health and socioeconomic problem in most of the developing countries is a chronic disease caused by different species of mycobacteria. According to WHO 10 million people fell ill with tuberculosis and 1.5 million people died from the disease in 2020 worldwide. TB is the 13th leading cause of death and second leading infectious killer after COVID 19. Though it is a treatable epidemic disease but results one of the most public health concern worldwide. To design and investigate a new therapeutic agent is one of the most difficult tasks for the medicinal chemists. Synthesis of heterocyclic systems consisting high nitrogen has been rising over the past decade owing to their usefulness in different applications such as propellants, explosives, pyrotechnics, and especially chemotherapy. In recent years, considerable attention has been received by the chemistry of triazoles and their fused heterocyclic derivatives. Due to synthetic and effective biological importance triazole derivatives are regarded as a new class of effective anti –TB candidates who show promising in vitro and in vivo anti-TB activities. This review article outlines the advances in application of incorporating 1, 2, 3 - triazole in dealing with the escalating problems of microbial resistance, and will explore the triazole scaffolds for the rational design of potent drug candidates having better efficacy, improved selectivity and minimal toxicity so that these hybrids can effectively be explored as potential leads to fight against this deadly disease Mycobacterium tuberculosis (M.tb).

Graphical Abstract:



Synthesis of 7-((1-phenyl, aryl, heteroaryl-1H-1,2,3-triazol-4-yl)methyl)-7H-pyrrolo [2,3-d] pyrimidines.

Keywords: Tuberculosis, therapeutic agent, heterocyclic systems, triazole derivatives, structure activity relationship.