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Biological Significance of Thiazole Derivatives

Indu Singh

Associate Professor, Department of Chemistry, Meerut College Meerut

Abstract: Thiazole ring is a five member heterocyclic compounds with nitrogen and sulphur atom. Various substituent of heterocyclic ring with thiazole ring showed wide range of pharmacological activities. Thiazole possesses pharmacological activity like antimicrobial, antifungal, anti-inflammatory, anticancer, antitumor activity etc. Many researchers and scientists have developed new drugs incorporating thiazole moiety with least side effects. From the various literature it has been found that thiazole derivatives easy to synthesized and biological active.

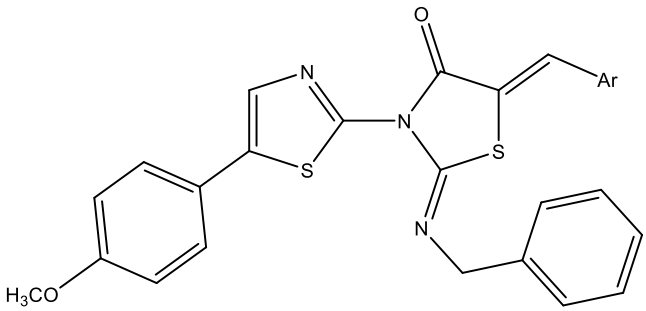
Keywords: Thiazole, biological activities, ant-inflammatory activity, antifungal activity, antibacterial activity, anticancer activity.

INTRODUCTION

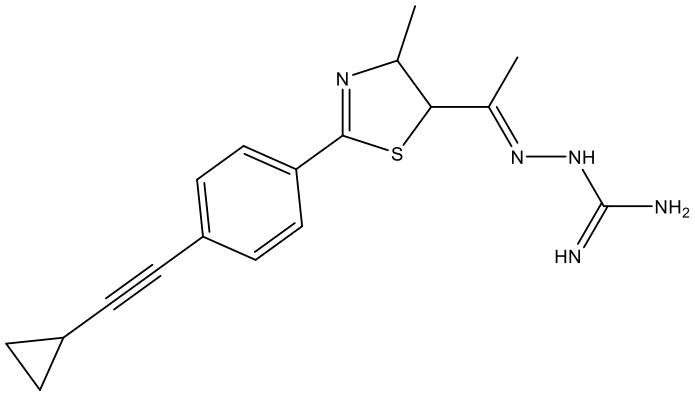
Heterocyclic compounds possess broad system of synthetic and biological applications. Thiazole is a part of heterocyclic compounds so it possess different pharmacological properties like antibacterial (Namitha, T.H. *et al*., 2021), anticancer (Farghaly, T.A. *et al*., 2024), cytotoxic (Al-Salmi, F.A. *et al*., 2023), antioxidant (Masoudi, M., 2024), antimicrobial (Pivovarova, E. *et al*., 2022; Khidre, R.E. *et al*., n.d.), anti-inflammatory (Sun, N. *et al*., 2016). Various scientists have observed that thiazole derivatives have shown biological properties. The current survey highlights wide range on synthesis and pharmacological action of drugs having thiazole moiety.

SIGNIFICANCE OF THIAZOLE DERIVATIVES

Hemaida, *et al*., 2021; have synthesized thiazole derivatives and reported their potential acetylcholinesterase inhibitors



An overview of synthetic derivatives of thiazole and their role in therapeutics have been synthesized by Kashyap, *et al*., 2024; and screening their antitubercular activity.



Swathykrishna, *et al*., 2023; have synthesized thiazole derivatives. They have tested and observed antimicrobial activity against different fungi as weii as bacteria.

***Corresponding Author:** Indu Singh

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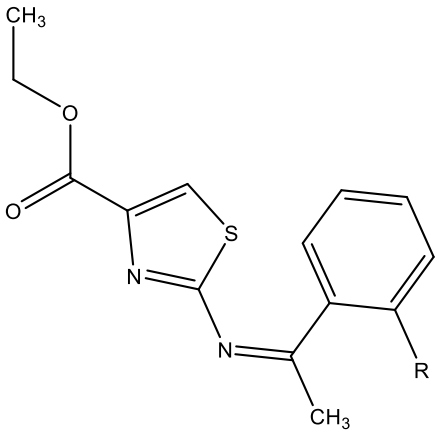
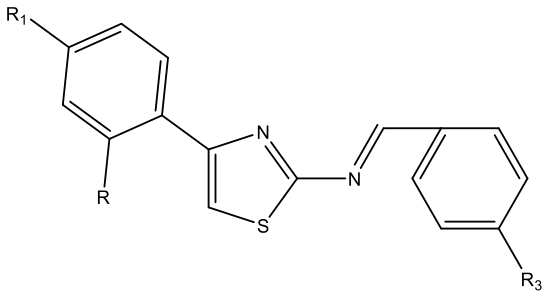
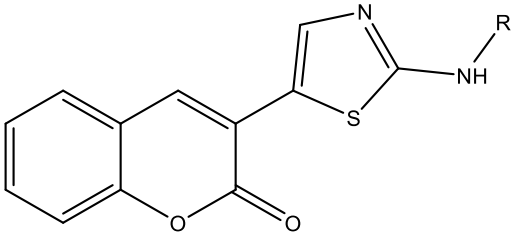


Lemillmu, *et al*., 2021; have synthesized thiazole based Schiff base derivatives: a combined experimental and computational study and screened their antibacterial and antioxidant activities.



Ibrahim and Rizk, 2020; have reported synthesis and biological evaluation of thiazole derivatives. In biological activity , they have showed antimicrobial and anticancer activity.



Synthesis, characterization, biological activities and computational studies of pyrazolyl-thiazole derivatives of thiophene have been synthesized by Bhagwat, *et al*., 2024; and explained antibacterial activity against different lke E.coli, B. subtiles, B. megaterium, S. aureus and against different fungi like A. niger, A. oryzae, Rhizopus, C. albicans.

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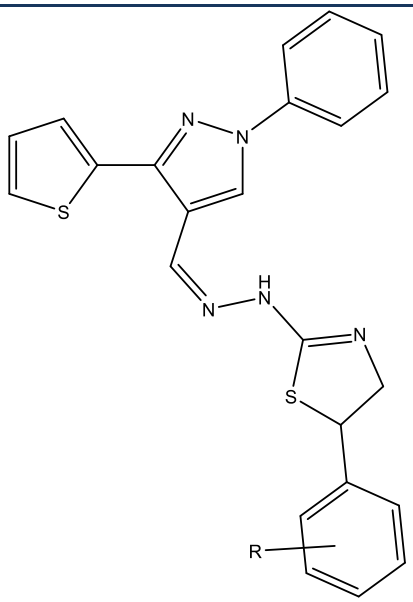
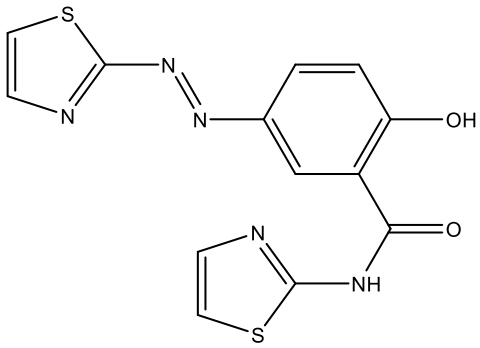
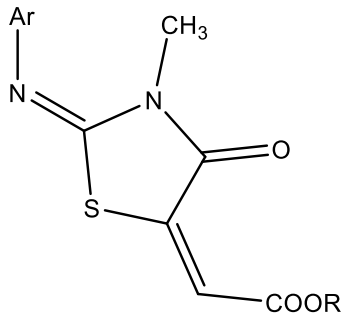


Aziz, *et al*., 2023; have synthesized azothiazole derivatives incorporating thiazole moiety and reported their multimodal biological activity.



Synthesis of new 1,3thiazole derivatives using 1-(4-carbomoylphenyl)-3-methylthiourea and 1-methyl-3-(Quinolin-8-yl)thiourea as starting materials have been synthesized by Doregiroee, *et al*.,.2015;



Mohammed and Jasim, 2022; have reported synthesis of new 1,3-oxazole and 1,3thiazole derivatives with expected biological activity. In biological activity they have showed antibacterial activity against different bacteria such as E. coli, S. aureus, Bacillus, K. pneumonia and against different fungi like candida albicans.

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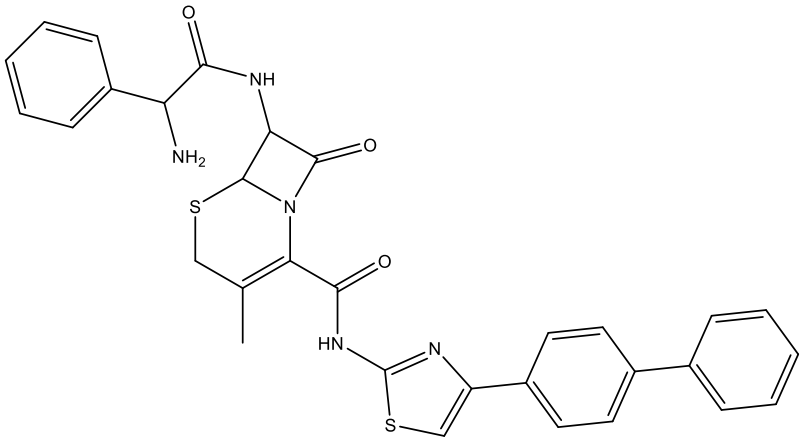
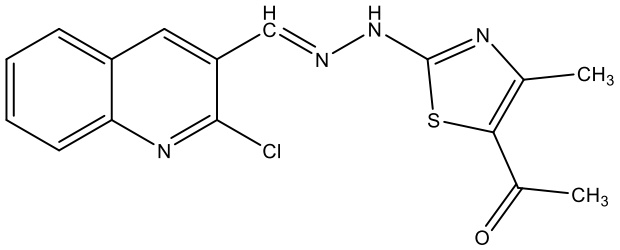
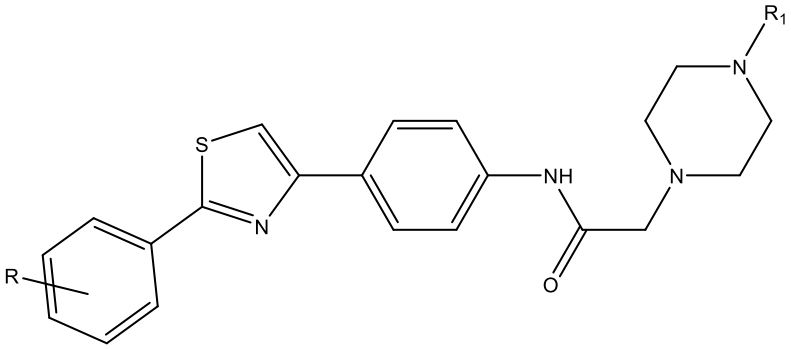


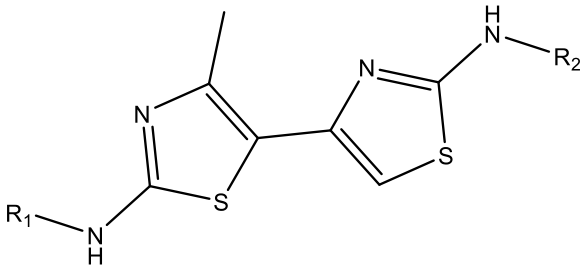
Synthesis, bioactivity screening and docking analysis of thiazole derivatives containing quinolene moieties have been synthesized by Sutradhar, *et al*., 2024;



Yurttas, *et al*., 2015; have synthesized of some new thiazole derivatives and screening their biological activity such as antifungal activity against candida parapsilosis.



An overview of the synthesis and antimicrobial, antiprotozoal and antitumor activity of thiazole and bisthiazole derivatives have been reported by Borcea, *et al*., 2021;



CONCLUSION

Thiadiazole is the most significant areas in pharmacological field and medicinal chemistry. Number of researchers and scientists give their idea to thiadiazole derivatives based on biological agents. In general, thiadiazole is a special nucleus with biological property like anticancer, antimicrobial, antifungal, anti-inflammatory etc. So this review focuses on the synthesis of the thiadiazole derivatives as well as pharmacological properties.

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