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## Recent advances in Synthesis & Pharmacotherapeutic potential of Benzothiazoles

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Isoquinoline is a heterocyclic aromatic organic compound. It is a structural isomer of quinoline. Isoquinoline and quinoline are benzopyridines, which are composed of a benzene ring fused to a pyridine ring. In a broader sense, the term isoquinoline is used to make reference to isoquinoline derivatives. 1-Benzylisoquinoline is the structural backbone in naturally occurring alkaloids including papaverine. The isoquinoline ring in these natural compounds derives from the aromatic amino acid tyrosine [1-6].

Amino-benzothiazoles constitute an important class of compounds. In recent year heterocyclic compounds analogues and derivatives have attracted strong interest due to their useful biological and pharmacological properties. The small and simple benzothiazole nucleus is present in compounds involved in research aimed at evaluating new products that possess biological activities, such as anti-tumor, anti-microbial, anthelmintic, anti-leishmanial, anti-convulsant and anti-inflammatory. The present review focuses on the different methods of the substituted benzothiazoles with potential activities that are now in development [7-15].

Benzothiazoles are bicyclic ring system with multiple applications. In the 1950s, a number of 2- amino benzothiazoles were intensively studied as central muscle relaxants. Biologist's attention was drawn to this series when the pharmacological profile was discovered. 6- trifluoromethoxy-2-benzothiazolamine was found to interfere with glutamate neurotransmission in biochemical, electrophysiological and behavioral experiments. After that benzothiazole derivatives have been studied extensively and found to have diverse chemical reactivity and broad spectrum of biological activity [16-22].

The reviewed new class of 2-substituted amino-benzothiazoles has shown wide spectrum of biological activities. The substituted benzothiazolylimino dithiazolidines and the 2-(2'-aryl-1, 3,4-oxadiazol-5-yl)mercaptomethyl benzothiazoles are having significant antibacterial activity. Significant anti-inflammatory activity is displayed by some new 2-(4'-butyl-3'-5'-dimethylpyrazol-1-yl)-6-substituted benzothiazoles and 4-butyl-1-(6'-substituted-2'-benzothiazol-2-yl)-3-methylpyrazol-5-ones [23-30].

Potent anti-tumor activity was demonstrated by a number of 2-(4-aminophenyl) benzothiazoles. The 2-(4-acetamido-2-bromo-5-methylphenyl sulfonamide) benzothiazole is found to be effective as anti-tubercular agents, whereas ethoxazolamide and o-acyl derivatives of 6-Hydroxybenzothiazole-2-sulfonamides are found to show the carbonic anhydrase inhibitory action. The biological profiles of these new generations of benzothiazoles represent much progress with regard to the older comp [31-36].

Heterocyclic analogues and their derivatives have attracted strong interest in medicinal chemistry due to their biological and pharmacological properties. Benzothiazole is a class of heterocyclic compounds having 2 hetero atoms namely, sulphur and nitrogen. The analogues of benzothiazoles and its derivatives have a significant role in research area especially in synthetic, medicinal and pharmaceutical chemistry because of their biological and pharmacological activity. These compounds have special significance in the field of Medicinal chemistry due to their remarkable pharmacological potentialities. Benzothiazole is an organosulfur heterocyclic compound, weakly basic in nature. They are widely found in bioorganic and medicinal chemistry with wide application in drug discovery. Benzothiazoles are fused membered rings, which contain the heterocycles bearing thiazole as central moiety [37-39]. A large number of therapeutic agents are synthesized with the help of benzothiazoles nucleus. In addition, benzothiazoles act as core nucleus in various drugs due to their various activities e.g. pramipexole, probenazole, lubeluzole, zopolrestat, ethoxazolamide and bentaluron etc. and their derivatives have attracted a great deal of interest due to their wide range of biological activities such as anticancer, antimicrobial, antitubercular, anti-HIV, cardiovascular, local anaesthetic, anti-inflammatory, anticonvulsant and anti-diabetic. The therapeutic properties of the heterocycles have encouraged the medicinal chemist to synthesize a large number of novel chemotherapeutic agents. This review is mainly an attempt to present the research work reported in the recent scientific literature focusing on different biological activities of benzothiazoles compounds.

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