

Note on Benzothiazole used in Modern Day Drug Designing and Development

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DESCRIPTION

Heterocyclic compounds are found throughout the life sciences areas. The chemistry of heterocyclic is crucial to drug development. In nature, medicine, and technology, these molecules play a variety of important roles. In the world of modern drug development, heterocyclic hybrids offer immense promise as the most promising compounds as lead structures for the design of innovative therapeutic candidates. Benzothiazoles (BT) analogues work against cancer by interacting with a variety of molecular targets. In the following text, several important examples of bio targets with which these variants interact are discussed. BTs are a powerful, highly selective, and new mechanistic class of anticancer medicines that have been shown to have antitumor action in human cell lines of ovarian, breast, lung, kidney, and colon carcinoma. Pharmaceutical sector are currently struggling with the development of new drugs and pharmaceuticals, which is a critical and difficult task. Benzothiazoles have the potential to be used in the development of new antiepileptic medicines. The anticonvulsant activity of this heterocyclic nucleus has been shown to be dependent on endocyclic sulphur and nitrogen activities. BT derivatives have been thoroughly researched and discovered to exhibit a diverse chemical reactivity profile as well as a wide range of biological actions. These compounds operate as key pharmacophores with a wide range of biological actions, and hence play an important role in medicinal chemistry. Organic and medicinal chemists have been driven to seek the synthesis of novel motifs and screen their pharmacophoric qualities due to the wide range of synthetic and medicinal properties demonstrated by heterocyclic hybrids. Because they are found in pharmacologically active natural compounds, versatile orientated functional materials, as well as highly effective medicines and agrochemicals, nitrogen-containing heterocycles, particularly the azoles family, are a constant source of interest in organic synthesis. Because it is employed as a synthon for the synthesis of bioactive compounds, benzothiazoles have been identified as the most interesting biophore in study. It's found in anticancer, antibacterial, anti-

inflammatory, anti-HIV, anti-malarial, anti-convulsant, anthelmintic, anti-oxidant, and analgesic chemicals used in research to evaluate new products with interesting biological properties. The bioactive heterocyclic scaffold's varied synthetic application aids organic chemists and pharmaceutical chemists in planning, organising, and implementing innovative techniques for the drug development of newer benzothiazoles. Furthermore, the benzothiazole system is found in a variety of marine and terrestrial natural chemicals with biologically beneficial properties. In biochemical, electrophysiological, and behavioral studies, a number of 2-aminobenzothiazoles have been reported as central muscle relaxants and found to interfere with glutamate neurotransmission. They've also found use in industry as antioxidants and vulcanization promoters. Due to their unique structure and applications as imaging agents for γ -amyloid plaques, photosensitizers, inhibitors of stearyl-coenzyme A-9 desaturase, LTD-4 receptor antagonist, orexin receptor antagonist, and also a derivative of benzothiazole is the light-emitting component of the γ -amyloid plaques, substituted benzothiazoles have received a lot of attention, e.g. luciferin like fireflies. Riluzole, Thioflavin, Pittsburgh compound B, Ethoxzolamine, Pramipexole, Dimazole, Flutemetamol, and Dithiazanine Iodide are some of the most important and clinically used benzothiazole-containing medications. An innovative strategy to using the benzothiazole motif as a biophore allows for the design, synthesis, and bio-evaluation of a wide range of novel molecular hybrids. As a result of this knowledge, new molecules with improved biological capabilities and higher selectivity could be designed, as well as novel synthetic methodologies. The most interesting aspect of the agrochemical and pharmaceutical industries has always been drug development. Organic synthesis has received a lot of attention in recent years, especially for molecules with more than one heterocyclic ring. Benzo-fused nitrogen, sulphur, and oxygen containing heterocyclic ring systems such as benzothiazole, benzimidazole, and benzoxazole are interesting compounds for medical and pharmaceutical chemistry because they have a wide range of high bioactivity.

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Received: 10-Feb-2022, Manuscript No. DDO-22-16033; **Editor assigned:** 14-Feb-2022, PreQC No. DDO-22-16033 (PQ); **Reviewed:** 02-Mar-2022, QC No. DDO-22-16033; **Revised:** 09-Mar-2022, Manuscript No. DDO-22-16033 (R); **Published:** 16-Mar-2022, DOI: 10.35248/2169-0138.22.05.207

Citation: Pathak PP (2022) Note on Benzothiazole used in Modern Day Drug Designing and Development. Drug Des.11:207

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