Editorial

Role of the Heterocycles to Design Anti-Cancer Agents

Worldwide cancer is regarded as a great threat to mankind. It leads to abnormal growth of the tissues by uncontrolled cell divisions. It was well established that cancer is a disease associated with unsuppressed growth and the spread of anomalous cells [1]. It is quite unfortunate that, till now, there is no specific potent medicine with a 100% success rate for cancer treatments. Though, a large number of drugs have been used for the treatment of various cancers. In some instances, these available drugs are causing side effects [2]. Efforts have been made to design new drug molecules or modify the existing drugs to reduce the side effects of these drugs [3]. On the other hand, more than half of the commercially available drugs consist of different heterocyclic structures [4]. Along with other biological activities, various synthetic heterocyclic scaffolds also showed significant anti-cancer activities [5-11]. Interestingly, it has been observed that the majority of the commercially available anti-cancer drugs possess heterocyclic moiety either as the main structural unit or as an important subunit [12]. Under this purview, during the last three decades, the screening of anti-cancer efficacy of various heterocyclic scaffolds has increased rapidly. Several naturally occurring, semi-synthetic and synthetic heterocyclic compounds have passed in clinical or preclinical anticancer trials [12]. Few of them showed significant anti-tumor activities and thus they are available in the market as promising drugs [13].

This thematic issue titled ‘Role of the heterocycles to design anti-cancer agents’ has covered a large number of literature related to the potent anti-cancer activities of structurally diverse heterocyclic scaffolds. This thematic issue highlights an up-to-date literature on the following selected eight topics contributed by the eminent research groups.

The first contribution titled ‘Heterocyclic compounds: Importance in anticancer drug discovery’ by Kumar and Goel deals with the role of various heterocyclic skeletons in the design and developments of anti-cancer drugs [14].

O-heterocycles are very common in natural products and in drug molecules. In the second contribution titled ‘Naturally occurring O-heterocycles as anticancer agents’ Prof. Biswanath Das and his research group nicely presented a wide range of naturally occurring O-heterocycles with potential anti-cancer activities [15].

Dr. Sasadhar Majhi, in the third contribution titled ‘Discovery, development, and design of anthocyanins-inspired anticancer agents-a comprehensive review’ describes the latest developments in the synthesis and chemical derivatization of various anthocyanin motifs having promising anti-cancer activities [16].

Pyrans and pyran annulated heterocycles have been found to possess significant anticancer activities [17]. The fourth contribution titled ‘Current developments in the pyran-based analogues as anticancer agents’ by Prof. Chawla and her group summarizes the anti-cancer efficacies of various pyran based scaffolds reported in recent times [18].

Various triazole derivatives have been found to possess significant pharmacological efficacies. On many occasions, it was found that the triazole moiety acts as the main building block for the synthesis of novel anticancer drugs. The fifth contribution titled ‘Design and development of triazole derivatives as prospective anticancer agents: A review’ by Dr. Harshita Sachdeva and her research group describes the latest developments in the synthesis of various triazole derivatives with promising anticancer efficacies [19].

The sixth contribution titled ‘Synthesis and anti-cancer applications of benzimidazole derivatives – Recent Studies’ by Dr. Ram Singh and his research group highlights the latest developments on the synthesis of structurally diverse benzimidazole derivatives having promising anticancer activities [20].

The last contribution of this thematic issue titled ‘A comprehensive review on journey of pyrrole scaffold against multiple therapeutic targets’ by Mir et al. describes the role of various pyrrole derivatives as anticancer, antibacterial, antiviral, antitubercular and anti-inflammatory agents [21].

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REFERENCES


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