

Editorial

Phenols and Polyphenols: Promise and Peril to Human Health

Min-Reviews in Medicinal Chemistry Journal is one of the extremely important and widely circulated journals of Bentham Science Publishers. The current thematic issue has been focused on the role of Phenols and Polyphenols on human health. Phenolic and polyphenolic derivatives constitute an interesting class of synthetic as well as natural organic compounds that possess miraculous antioxidant properties as such because of their ability to quench or reduce the free radicals which are generated due to pro-oxidant-induced oxidative stress which, in turn, accelerate numerous associated chronic diseases. Additionally, these compounds also act as antibiotics and possess a wide range of biological activity such as anti-cancer, anti-tumor, anti-bacterial, antifungal, anti-septic anti-diarrheal, anti-ulcer, anti-inflammatory activities *etc.* In spite of great importance, these compounds also exhibit adverse effects on diverse biological systems particularly when taken in a larger amount. For example, several flavonoid derivatives inhibit thyroid peroxidase (an enzyme) and thus interfere the biosynthesis of thyroid hormone and ultimately thyroid function. Tannins, one of the major polyphenol in foodstuff, when consumed in large amount can lead to formation of tannin-protein complexes, a group of indigestible complexes, inhibit digestive enzymes and affect the utilization of vitamins and minerals. Among bisphenols, bisphenol A (BPA) is frequently used to make a hard, clear plastic known as polycarbonate, which has been used in many consumer products including water bottles, baby bottles, metal-based food and beverage cans etc. FDA also recognized some substantial uncertainties regarding their potential implications for human health effects. A number of reports have shown their toxicity behavior and disclosed the detrimental face of this class of compounds. Therefore, efforts have been made to explore the importance of phenolic compounds in human life and some considerable facts associated to human health through various articles contributed by diverse range of authors. Here is the brief summary of the six contributed articles:

Arbi *et al.*, observed the antiproliferative effects of some phenolic and non-phenolic aryl butenes against K562 cells. Their potential to induce skin depigmentation by evaluating their anti-tyrosinase activity has also been explored. In the study, hydroxytamoxifen and some aryl butenes showed strong antiproliferative effects against K562 cells at 1 μM without showing tyrosinase inhibition and thus have been identified as candidates for further development against chronic myeloid leukemia (CML), and are predicted to not induce depigmentation of the skin, a side effect encountered with imatinib [1, 2], a conventionally used drug for the treatment of CML. Aguilar *et al.*, described the sources, biosynthesis and the purification of ellagitannins which constitute one of the important classes of water-soluble polyphenolic natural products [3]. Health benefits associated with these polyphenolic compounds have also been highlighted [4, 5].

Goel *et al.*, presented a holistic outlook on occurrence of various polyphenols and their health benefits. Polyphenols are considered as “*Healing compounds from Nature’s own pharmacy*” [6, 7]. The influence of dietary polyphenols on gut microbiota has also been discussed. Thota reviewed on the development of polyphenols as antitumor agents in recent research studies. Specially, role of polyphenols derived from plant, red wine, black and green tea has been presented [8-10]. A diversity of nutritional polyphenolic components in human diet exhibits the great potential of anti-inflammatory effects [11]. Some components derived from plants like Resveratrol, Curcumin, Rutin, and Oleocanthal are clinically approved as herbal medicines for traditional use and curing inflammatory disorder such as hepatitis, arthritis, and colitis [12-14]. Kinger *et al.*, summarized the anti-inflammatory benefits of plants derived very prominent dietary polyphenolic compounds particularly, Oleocanthal, Curcumin, Resveratrol and Quercetin. Gallic acid (3, 4, 5-trihydroxybenzoic acid), a low molecular triphenolic compound has arisen as an efficient apoptosis inducing agent. The antimicrobial and other biological properties of gallic acid and its derivatives seemed to be linked with the hydrolysis of ester linkage between gallic acid and polyols like tannins hydrolyzed after ripening of many edible fruits [15-18]. Beniwal *et al.*, summarized the diverse roles played by gallic acid, its antioxidant potential, action mechanism and more importantly the diverse array of applications in therapeutic and pharmaceutical area.

The quality publications by the Journal are the result of a joint effort made by a dedicated editorial team members, reviewers and authors. The lead guest editors would like to extend their gratitude to editorial team members and authors of this issue for their valuable scientific contributions. We also thank the valuable comments and suggestions given by the reviewers to improve the quality and scientific perspective of the articles. In the end, if you have any suggestion to further improve the journal; please feel free to drop a line to the MRMC.

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Guest Editors: Mini-Reviews in Medicinal Chemistry

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