Recent developments on (−)-colchicine derivatives: synthesis and structure-activity relationship

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ABSTRACT

(−)-Colchicine, an anti-microtubulin polymerization agent, is a valuable medication and the drug of choice for gout, Behçet’s disease and familial Mediterranean fever. It has a narrow therapeutic index due to its high toxicity towards normal cells. Nonetheless, numerous (−)-colchicine derivatives have been synthesized and studied for their structure-activity relationship and preferential toxicity. Different functional groups such as amides, thioamides, N-arylurea and 8,12-diene cyclic have been incorporated into (−)-colchicine, resulting in derivatives (with moieties) that include electron-withdrawing and electron-donating groups. This review article focuses on recent developments in the chemical synthesis of (−)-colchicine derivatives, the substituents used, the functional groups linked to the substituents, the moieties and biological studies. Moreover, the current classification of derivatives based on the (−)-colchicine rings, namely ring A, B, and C (−)-colchicine derivatives, is discussed. This work demonstrates and summarizes the significance of (−)-colchicine derivatives in the biological field, and discusses their promising therapeutics for the future.

KEYWORDS
(−)-Colchicine; (−)-Colchicine derivatives; Structure-activity relationship
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