Colchicine prodrugs and codrugs: Chemistry and bioactivities

Abdullah A. Ghawanmeh a,*, Kwok Feng Chong a, Shaheen M. Sarkar a, Muntaz Abu Bakar b, Rizaﬁzah Othaman b, Rozida M. Khalid b

a Faculty of Industrial Sciences & Technology, University Malaysia Pahang, Gambang, 26300 Kuantan, Pahang, Malaysia
b School of Chemical Sciences and Food Technology, Faculty of Science and Technology, University Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia

A R T I C L E  I N F O

Article history:
Received 22 September 2017
Received in revised form 6 December 2017
Accepted 7 December 2017
Available online 8 December 2017

Keywords:
Colchicine
Prodrugs
Codrugs
Biological activities

A B S T R A C T

Antimitotic colchicine possesses low therapeutic index due to high toxicity effects in non-target cell. However, diverse colchicine analogs have been derivatized as intentions for toxicity reduction and structure-activity relationship (SAR) studying. Hybrid system of colchicine structure with nontoxic biofunctional compounds modiﬁed further affords a new entity in chemical structure with enhanced activity and selectivity. Moreover, nanocarrier formulation strategies have been used for colchicine delivery. This review paper focuses on colchicine nanoformulation, chemical synthesis of colchicine prodrugs and codrugs with different linkers, highlights linker chemical nature and biological activity of synthesized compounds. Additionally, classiﬁcation of colchicine prodrugs based on type of conjugates is discussed, as biopolymers prodrugs, ﬂuorescent prodrug, metal complexes prodrug, metal-labile prodrug and biocompatible prodrug. Finally, we brieﬂy summarized the biological importance of colchicine nanoformulation, colchicine prodrugs and codrugs.

© 2017 Elsevier Masson SAS. All rights reserved.