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Enzymatic synthesis of steryl glycosides and their anticancer therapeutic applications

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Steryl glycosides consist of a sterol/steroid aglycone and one or more sugar moieties linked through an ether or ester bond. Diverse biological activities, including anti-inflammatory, anti-fungal, anti-microbial, anti-parasitic and anti-tumor activities and properties such as cell membrane modification, regulation of host defenses against pathogens, lipid metabolism and developmental events, have been attributed to this family of natural products. Development of structural diverse steryl glycosides may hold potential to identify candidates for new drug development and pharmaceutical applications. In this study, we functionally express different glycosyltransferases for *in vitro* synthesis of steryl glycosides with α - or β -configuration specificity. The synthesized steryl glycosides were investigated for their anticancer activity. Interestingly, several steryl glycosides show dose-dependent depression of cell viability and enhanced drug effectiveness on MCF-7 breast cancer cells. The structure-reactivity relationships of these glycosyltransferases on substrate-donor specificities and mode of action of steryl glycosides on anticancer activity will be discussed.

Biography

Tung-Kung Wu has completed his PhD degree in Biophysics from the Johns Hopkins University and Postdoctoral studies in Chemistry Department from Stanford University. He is working as a Professor in the Department of Biological Science and Technology at the National Chiao Tung University, China. His research interests include interdisciplinary fields of bioorganic chemistry, chemical biology and medicinal chemistry. His current research interests mainly focus on the structure-reactivity relationships of glycoenzymes and mode of action of steryl glycosides as drug candidates.

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