PROTEIN EXPRESSION PROFILE OF GLYCITEIN-TREATED CHOLANGIOCARCINOMA KKU-M213 CELL LINE

Charin Thawornkuno[1], Onrapak Reamtong[1], Thitiluck Swangsri[1], Poom Adisakwattana[2], Nathamon Ngaosuwankul[3], Sopit Wongkham[4], Polkit Sangvanich[5], Kozo Asano[6] and Songsak Petmitr[1]

[1]Department of Molecular Tropical Medicine and Genetics, [2]Department of Helminthology, [3]Department of Microbiology and Immunology, Faculty of Tropical Medicine, Mahidol University, Bangkok; [4]Department of Biochemistry, Liver Fluke and Cholangiocarcinoma, Faculty of Medicine, Khon Kaen University, Khon Kaen; [5]Department of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok, Thailand; [6]Graduate School of Agriculture, Hokkaido University, Hokkaido, Japan

Abstract. Cholangiocarcinoma (CCA), a malignant epithelial neoplasm originating from the biliary tract, is a serious health problem of northeastern Thailand. Currently, there are no effective drugs against this cancer. Among isoflavones daidzein, genistein and glycitein, and equol, a derivative of daidzein, glycitein demonstrated the highest inhibitory effect of on the proliferation of human cholangiocarcinoma cell line KKU-M213 with an IC_{50} (50% inhibitory concentration) of 27 μM. As a first step towards understanding its mechanism of action, differential protein expression profiling of glycitein-treated and -untreated KKU-M123 cells were conducted using mass spectrometry (MS). Two hundred and fifteen proteins were expressed in both test cells; 129 and 114 proteins only in glycitein-treated and untreated cells respectively; 39 up-regulated and 14 proteins down-regulated in treated compared to untreated cells. The majority of up-regulated proteins were classified as those involved in metabolic and cellular processes, while that of down-regulated proteins also included transport, cell cycle, developmental process, and cellular component organization. These relative fold differences obtained from MS analysis were confirmed by western blotting of two representative proteins. These results provide baseline proteomics data that should be of assistance in identification of isoflavones anti-proliferative mechanisms against CCA and help guide future discovery and development of chemotherapeutic agents from natural products.

Keywords: cholangiocarcinoma cell line, glycitein, isoflavone, mass spectrometry, proteomics

Correspondence: Prof Songsak Petmitr, Department of Molecular Tropical Medicine and Genetics, Faculty of Tropical Medicine, Mahidol University, 420/6 Ratchawithi Road, Ratchathewi, Bangkok 10400, Thailand.
E-mail: songsak.pet@mahidol.ac.th