In vitro Study of Flavonoids, Fatty Acids, and Steroids on Proliferation of Rat Hepatic Stellate Cells

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There is a wealth of evidence that hepatic stellate cells (HSCs) orchestrate most of the important events in liver fibrogenesis. After liver injury, HSCs become activated to a profibrogenic myofibroblastic phenotype and can regulate net deposition of collagens and other matrix proteins in the liver. The proliferation of HSCs is mainly stimulated by the platelet-derived growth factor (PDGF). In this study, some compounds from natural resources have been tested for their activity to inhibit PDGF-driven proliferative activity of rat HSCs. Apigenin, quercetin, genistein, daidzin, and biochanin A exhibited > 75% inhibitory activity against HSC-T6. It was found that, γ-linolenic (γ-Ln), eicosapentanoic (EPA) and α- linolenic (α-Ln) acids showed a high inhibitory effect on proliferation of rat HSCs at 50 nmol/l. Cholest-4-ene-3,6-dione and stigmastone-4-en-3,6-dione are the most active steroids with inhibitory activities > 80% and this is most likely due to the presence of the 4-en-3,6-dione moiety in both compounds. These results revealed that the compounds which effectively blocked HSC proliferation may be beneficial in liver fibrosis. Structure-activity relationships (SAR) may provide a basis for rational structure modification.

Key words: Hepatic Stellate Cells, Steroids, Liver Fibrosis