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# INFLUENCE OF GENISTEIN AND ITS BENZYL DERIVATIVES ON THE PROPERTIES OF MODEL LIPID BILAYERS

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**Genistein (5,7,4'-trihydroxyisoflavone) is an isoflavone abundant in soybeans and found also in other plants of *Fabaceae*. It plays an important role as a phytoestrogen, and shows a wide variety of other pharmacological effects in human cells. The most important are: inhibition of tyrosine kinases and chemoprotectant activity against cancer and cardiovascular disease. Genistein became a subject of many studies when those new biological activities (as chemoprevention against cancer and cardiovascular disease) were found.**

**To optimize the beneficial biological effects of genistein efforts are made to synthesize the derivatives of this isoflavone, which would be even more potent than genistein itself. In the present work we studied the influence of genistein and its synthetic derivatives, 7-O-(4-cyanobenzyl)-genistein (IFG73), 7-O-(3-chlorobenzyl)-genistein) (IFG71) on lipid bilayers. Isoflavone effects were assessed by spectrofluorimetry using unilamellar liposomes labeled with Laurdan and DPH.**

**The benzyl derivatives studied caused concentration-dependent increase of Laurdan generalized polarization (GP). The effects exerted by both IFG73 and IFG71 on lipid bilayers were bigger than effect of genistein itself. We measured also the dependence of GP on temperature (in DPPC liposomes), which showed that the isoflavones affect bilayer in liquid-crystalline phase, while no interaction effects were found for bilayers in gel phase. The GP dependence on the excitation wavelength studied at different temperatures showed that no phase separation is induced by the compounds studied in DPPC liposomes.**

**DPH used as a fluorescent dye allowed to observe that benzyl genistein derivatives decrease the fluidity of lipid bilayers. The effect was again observed only for bilayers in liquid-crystalline phase, IFG71 was more potent than IG73.**

**The presented results allow to conclude that the isoflavones studied interact with polar heads of lipids in bilayers. The order of this region in the fluid phase is slightly increased by genistein derivatives. This effect may occur due to formation of hydrogen bonds between the isoflavones studied and lipids.**