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**ABSTRACTS**

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## Study of the Effect of Taxifolin upon Cell Enlargement and Condition of Collagen Fibrils

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Taxifolin is one of the flavonoid series antioxidants displaying P vitamin activity and having antitumoral, antimutagenic, antiallergic and antiphlogistic properties. Taxifolin's use in medicine on an increasingly wider scale makes it necessary to carry out research and study its effect upon cells and territorial matrix.

It is well known that depending on their concentration flavonoids can either stimulate or inhibit cell enlargement as well as cause cell death. Flavonoids are known to form hydrogen, hydrophobic and covalent bonds with collagen molecules at aromatic amino acid, tryptophan and lysine sites. (Viljanen K., 2005)

The aim of this work was to study the effect of taxifolin upon cell activity and condition of collagen fibrils in a model system of collagen gel as well as to determine concentrations at which the preparation under study could be used for tissue engineering applications.

The study was made using **Flavocon**® (Bioflavon Ltd, Obninsk, Russia) preparations containing taxifolin. The effect of taxifolin upon type I collagen fibrils' thermal stability was studied using the differential scanning microcalorimetry method. To study taxifolin's effect upon cells we used line L929 fibroblasts cultured in DMEM, 199 (1:1, v/v) containing 0.5 percent of FBS (HyClone) serum.

The study of the effect of taxifolin on type I collagen's thermodynamic characteristics shows a significant increase in the collagen fibril melting temperature and increased cooperativity of phase transition in collagen fibrils incubated with taxifolin at Flavocon® concentrations higher than 0.001mg/ml, with taxifolin's stabilizing effect depending on the preparation's concentration as well as on the time of the exposure to it. The changes of fibril melting temperatures and phase transition cooperativity at taxifolin concentrations within the 0.00001-0.1 mg/ml range are generally completed at the end of the first month of incubation at 37°C, with the difference among collagen fibril melting temperatures for different taxifolin concentrations persisting even after two months of incubation. The data obtained are indicative of dihydroquercetin's being capable of stabilizing the collagen matrix.

Our study of taxifolin's effect upon line L929 fibroblast culture has shown that for these cells 0.1 mg/ml is a toxic concentration. Within the 0.0001-0.01 mg/ml range there is a peak at 0.001 mg/ml indicating a stimulating effect upon cell proliferation. Practically no difference at all could be seen between the experiment and control in all of the experiments run at lower taxifolin concentrations (0.00001 mg/ml). This allows us to make a conclusion about taxifolin's dose-dependent action upon cell activity, which is typical of flavonoids, the concentration of 0.001 mg/ml being the optimal one for taxifolin preparations to be used in tissue engineering applications.

*Viljanen K. (2005) Protein oxidation and protein-lipid interactions in different food models in the presence of berry phenolics, ACADEMIC DISSERTATION, University of Helsinki Department of Applied Chemistry and Microbiology Food Chemistry*