

We report for the first time, that seed treatment with CP induced substantial changes of the amount of isoflavones in leaves of red clover: the content of F was decreased (up to 34%), and that of BA – increased (up to 58%), so that F/BA ratio in ‘Sadūnai’ increased from 0.84 to 1.48 (CP 5 min) and 1.0 (CP 7 min), in ‘Vyčiai’ – from 0.59 to 1.34 (CP 5 min). EMF treatments decreased the amount of both F and BA (by 15-20%).

The obtained data indicate that short time pre-sowing treatment of red clover seeds with CP and EMF induces multiple stress response and leads to modulation of economically important plant traits – improved germination, increased biomass, and amount of pharmaceutically important secondary metabolites.

ASSESSMENT OF APOPTOSIS IN CHRONIC CARRAGEENAN-INDUCED GASTROENTEROCOLITIS BY FLUORESCENT PROBES

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Introduction. Carrageenan (E407) has been widely used in the modern food industry as a thickener and stabilizing agent. It can be found in processed meat, sausages, and dairy products. However, it has been reported that this food additive is able to induce inflammatory processes, including peritonitis, arthritis, gastroenterocolitis, etc. Nevertheless, the precise mechanisms of carrageenan-induced inflammation are still not elucidated.

Aim. The aim of our research was to study the state of apoptosis in small intestinal enterocytes of rats with chronic carrageenan-induced gastroenterocolitis using fluorescent probes O1O (2 – (2'-OH-phenyl)-5-phenyl-1,3-oxazole) and PH7 (2 – (2'-OH-phenyl)-phenanthrene).

Materials and methods. Twenty female WAG rats were used in the experiment. They were subdivided into two groups (n=10): 1) Control group (intact healthy animals); 2) Animals with chronic carrageenan-induced gastroenterocolitis. The disease was caused by 1-month oral intake of 1% carrageenan solution in drinking water. The development of gastroenterocolitis was proven biochemically and morphologically. The fluorescence of O1O and PH7 probes was measured using spectrofluorometer Hitachi F4010 after 1 hour after the addition of probes to a solution of cells. The fragments of the small intestine were removed and placed on the cold immediately after decapitation of rats. Intestinal perfusion was carried out using cooled physiological solution. Epithelial cells were detached by scraping the inner surface of the intestine by

anatomical knife. A suspension of epithelial cells was made in Tris-HCl buffer (pH 7.4). To evaluate the apoptosis rate by biochemical methods, the activity of caspase-3 and soluble FAS-ligand level in blood serum were measured by ELISA. To determine the concentrations of parameters mentioned above, we used the StatFax 303+ stripper immunoassay analyzer manufactured by *Awareness Technology Inc.* (USA). Obtained results were statistically processed using the GraphPad Prism 5 application. Manipulations with animals were carried out in accordance with the provisions of the European Convention for the Protection of Vertebrate Animals used for Experimental and other Scientific Purposes (Strasbourg, 1986).

Results. The fluorescence of PH7 probe was not affected. However, changes in fluorescence of the O1O probe were found in animals of the second group. An increase in hydration of microenvironment in polar fragments of lipid bilayer of enterocytes was observed. This indicated the activation of apoptosis. This fact was also proven by elevation of such markers of apoptosis as caspase-3 (over 40 times) and soluble FAS-ligand (twice) in blood of rats with chronic carrageenan-induced gastroenterocolitis compared to the control group.

Conclusions. We can make a conclusion that chronic carrageenan-induced gastroenterocolitis is accompanied by activation of apoptosis, confirmed by overhydration of polar regions of enterocytes' membranes (O1O probe) and elevation of blood caspase-3 activity and soluble FAS-ligand concentration.

ОЦЕНКА АПОПТОЗА ПРИ ХРОНИЧЕСКОМ КАРРАГИНАН-ИНДУЦИРОВАННОМ ГАСТРОЭНТЕРОКОЛИТЕ МЕТОДОМ ФЛЮОРЕСЦЕНТНЫХ ЗОНДОВ

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Целью нашего исследования явилось изучение состояния апоптоза в энтероцитах тонкого кишечника крыс с хроническим каррагинан-индуцированным гастроэнтероколитом с использованием флюоресцентных зондов O1O (2 - (2 - OH - фенил) -5 - фенил - 1,3 - оксазол) и PH7 (2 - (2 - OH - фенил) - фенантрен). Развитие каррагинан-индуцированного гастроэнтероколита сопровождается увеличением гидратации микроокружения в полярных фрагментах липидного бислоя энтероцитов, что указывает на активацию апоптоза. Апоптоз также подтвержден повышением таких маркеров, как каспаза-3 и растворимый FAS-лиганд.

DEVELOPMENT OF MITOCHONDRIA DYSFUNCTION DURING DIABETES

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Mitochondria are the center of fatty acid and glucose metabolism and thus they are highly likely to be impacted by impaired metabolism associated with