УДК 579.852 : 579.222

EFFECT OF PROBIOTIC ENDOSPORIN ON INDICATORS OF THE IMMUNE SYSTEM OF INTACT ANIMALS.

Safronova L.A., Didenko G.V.

Probiotic endosporin in case of orally introducing to intact organism stimulates synthesis of humoral immunity factors which significantly increasing the cytotoxic effect of the effector cells, stimulating macrophage cell activity, and have little effect on the activity of lymphocytic cells. Introduction endosporin not lead to the development of inflammatory reactions in experimental animals.

***Key words**: probiotic endosporin, indicators of immune system, lymphocytes, macrophages*

Probiotics are products (preparations) based on living microorganisms; their use in adequate amounts provides a positive effect on the health of the host organism. One of the determining factors for therapeutic and prophylactic action of bacilli-based probiotics is their positive effect on the immune reactivity of the macroorganism.

It has been studied effect of probiotic product “Endosporin” on indicators of immunity at single and five-time oral introduction of intact laboratory animals. It was found out significant increase in cytotoxic and functional macrophage activity of animals treated “Endosporin” during five days comparing with the control group. Addition of serum to the test system (macrophages / tumor cells) resulted in a significant increase in cytotoxic activity of peritoneal macrophages.

“Endosporin” introduction did not lead to a noticeable change in the cytotoxic activity of lymphocytes. However, in the group of animals treated with “Endosporin” for five days, the cytotoxic activity of lymphocytes was higher than in groups of intact animals and one-time treated animals.

At study of cooperative cytotoxic effect of macrophage cells and lymphocytes was established pattern of reactions similar to tests of cytotoxic effect of

macrophages. In the group of animals treated “Endosporin” for five days was observed a significant increase in the display of cytotoxic effect of macrophages and lymphocytes comparing to mice that were not treated with the probiotic.

Adding to the test system (lymphocytes, macrophages / tumor cells) autologous serum significantly increased the cytotoxic activity after treatment mice of experimental groups that coincide with the peaks of the standard antibody synthesis. For 5-day treated animals indicators of cooperative macrophage and lymphocyte cytotoxic effect were significantly higher during the whole observation period than in groups of intact and one-time treated animals. Results of this experiment correlate with those obtained in the study of antibody cytotoxic activity of macrophages.

Studies of circulating immune complexes of different molecular weight in the serum showed that “Endosporin” introduction does not cause inflammatory reactions of test organisms.

Probiotic promotes the synthesis of humoral effector cells stimulates the activity of cells of macrophage series and has insignificant effect on the activity of the cells of lymphocytic series. Fivefold “Endosporin” introduction results more pronounced and prolonged immune stimulatory effects in experimental animals comparing to one-time probiotic introduction.

References

1. Дворщенко О. С. Моделювання ксеношенних клітинних схем на твердих фазах з використанням пухлиноасоційованих та ембріональних антигенів та їх застосування в протипухлинній терапії/О. С. Дворщенко, О. В. Діденко, О. І. Чередарчук//Доповіді НАН України.-2007.-№12.-С.155-161.

2. Влияние живых культур *Bacillus subtilis* на неспецифическую резистентность организма /[В. А. Кудрявцев, Л. А. Сафронова, А. И. Осадчая и др.]// Микробиол.журн. -1996. - Т.58.- №2. – С.46-54.

3. Лакин Г. Ф. Биометрия / Г. Ф. Лакин – М.: Высшая школа, 1980. – 293с

4. Похиленко В. Д. Пробиотики на основе спорообразующих бактерий и их безопасность / В. Д.Похиленко, В. В.Перелыгин //Химическая и биологическая безопасность. - 2007. - № 2-3. - С.20-41.

5. Фролов В. М. Ефективність аналізу циклоферину у хворих з тяжким перебігом епідемічного паротиту /В. М. Фролов, І. В. Лоскутова.// Проблеми епідеміології, діагностики, клініки, лікування та профілактики інфекційних хвороб– К: Наукова думка. – 2002. – С. 414-417

6. *Пат.14569 Украина, А61К35/74,С12 N1/20.* Биопрепарат эндоспорин для лечения и профилактики эндометритов животных / В. В. Смирнов, В. А. Кудрявцев, А. И. Осадчая, Г. Н. Калиновский, Л. А. Сафронова. – Опубл.11.10.99, Бюл.№6

7. Cutting S. M. Bacillus probiotics [S. M. Cutting] / Food Microbiology. – 2011. –Vol. 28. – P. 214-220.

8. Duc Le.H. Characterization of Bacillus Probiotics available for human use [/Le. H. Duc, Huynh A. Hong, T. M. Barbosa, A. O. Henriques] //Appl. and Environ. Microbiol. – 2004. - Vol. 70. –№ 4. – P. 2161–2171.

9. Guidlines for the Evalution of Probiotics in Food// Report of a Joint FAO/WHO Working Group on Drafting Guidlines for the Evalution of Probiotics in Food. London, Ontario,Canada, April 30 and May 1, 2002.

10. Ohno M. Rapid colorimetric assay for the quantification of leukemia inhibitory factor (LIF) and interleukin–6 (IL–6) / M. Ohno, T. Abe // J. Immunol. Methods. – 1991. – № 145. – P. 199-203.

11. Sanders M. E. Sporeformers as Human Probiotics: *Bacillus*, *Sporolactobacillus* and *Brevibacillus*/ M. E. Sanders, L. Morelli, T. A. Tompkins //Comprehensive Reviews in Food Science and Food Safety.— 2003. - Vol. 2. - P.101-110

12. Stanojkovic T. P. The antitumor immune response in HER–2 positive, metastatic breast cancer patients / T. P. Stanojkovic, Z. Zizak, T. Srdic // J. Transl. Med. – 2005. – № 3. – P.13.

Sun P. Effects of *Bacillus subtilis* natto on performance and immune function of preweaning calves/P. Sun, J. Q