Alpha-fetoprotein is widely used in oncology clinic and in obstetrics. It is an excellent system for studying the regulation of tissue-specific and embryo-specific proteins in normal development.

The aim of the work is to analyze the content of alpha-fetoprotein in patients with systemic scleroderma.

The content of alpha-fetoprotein is determined in the blood of twenty of the observed. Ten of them are a control group, the rest are sick with systemic scleroderma. Alpha-fetoprotein is determined by immunoradiometric assay *kit.*

In the patients with systemic scleroderma, serum alpha-fetoprotein levels are increased in comparison with the control group.

Statistical analysis shows that the differences in the groups are statistically significant, suggesting that serum alpha-fetoprotein levels could be used as a marker in the differential diagnosis of systemic scleroderma.

BIBLIOGRAPHY

1. *Бакун, Н. В*. Содержание альфа-фетопротеина у больных системной склеродермией / Международный экологический институт им. А. Д. Сахарова БГУ. – Минск, 2017. – 29 с.

2. *Глейберман А. С.* // Бюллютень экспериментальной биологии. – 2001. – Т. 93, № 4. – С. 55–58.

3. Шмагель К. В., Черешнев В. А. Альфа-фетопротеин: строение, функции и роль в эмбриогенезе // Акушерство и гинекология. – 2002. – № 5. – С. 6–8.

4. *Шмагель К. В., Черешнев, В. А.* Альфа-фетопротеин: диагностическое значение в акушерстве // Акушерство и гинекология. – 2002. – № 5. – С. 8–11.

THE COMPARISON OF EXPRESSION LEVELS FOR THE YELLOW GENE AND ELONGATION FACTOR GENE DROSOPHILA MELANOGASTER AT DIFFERENT STAGES OF THE DEVELOPMENT

N. Bakun, A. Chukholskiy

Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
natashabakun96@mail.ru

The expression levels for the yellow gene and elongation factor gene Drozophila melanogaster at different stages of the development are very different which is due to the peculiarities of synthetic processes at these stages.

Keywords: yellow gene, elongation factor gene, polymerase chain reaction, Drosophila melanogaster

Drosophila melanogaster is so good object in genetic. Drosophila melanogaster is a small, easily reared insect with a short lifecycle.

The key advantages are a balance between genetic power and biomedical relevance, and rapidity and low cost of generation and maintenance of mutant and transgenic stocks. The genetic toolbox available for Drosophila allows precise intervention in specific, defined cells in an atherwise normal organism, opening unique opportunities for functional biology. Approximately 70 % of human genes have clear Drosophila homologues.

We stady expression of Drosophila melanogaster genes.

The yellow gene is involved in pattern-specific melanin pigmentation of the cuticle of the adult fly and of laval mouth parts of Drosophila melanogaster.

We estimated the expression levels for the yellow gene and elongation factor gene Drozophila melanogaster at different stages of the development. We worked in Dzelepov laboratory of nuclear problems.

We obtained the RNA extraction from lavals and adult fles. Then looked at the results of presence of this materials on electrophoresis in agarose gel. On the gel we saw not only mRNA and rRNA fragments, but the part of degradete dRNA and part of gDNA. We saw DNA as getting a pure RNA is so difficunt.

We conducted a reaction of reverse transcription with enzyme reverse transcriptase for converting RNA sequence to complementary DNA (cDNA). Then we fulfilled real-time polymerase chain reaction. Levels of amplified cDNA are measured by fluorescence with SYBR Green.

Analys by specific computer program showed that expression of lavae yellow gene is low er in 10 times compared to the expression of lavae elongation factor gene and expression of lavae yellow and elongation factor genes is higher in 1000 times compared to imago (adult flies).

This differences are due to the fact in the early stages of development, in any organism, synthetic processes are more intensify, they need more nucleic acids to construct the necessary proteins.

In this way the expression levels for the yellow gene and elongation factor gene Drozophila melanogaster at different stages of the development are very different which is due to the peculiarities of synthetic processes at these stages.

HYPERGLYCEMIA UNJUST-CHANGE OF NEUTROPHILS MICROBICIDAL

D. Bobrukevich, Ya. Melnikova

Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
darabo@mail.ru

The influence of simulated conditions of light and moderate severity hyperglycemia on the activity of enzymes of the "respiratory explosion" of human peripheral blood neutrophils in vitro was studied.

Keywords: hyperglycemia, neutrophils, NADPH oxidase, diabetes, hyperglycaemic coma, hyperglycemic syndrome.

The question of the participation of neutrophils in the regulation of the immune and other parts of homeostasis is currently under close scrutiny. neutrophils are not only eliminating, auxiliary and effector cells, but also cells involved in the initiation and regulation of immunological reactions [1].

NADPH oxidase is the leading enzyme of oxygen dependent microbiocidal neutrophils. Increase in the concentration of glucose in the blood is noted with an increase in hormonal activity of the pituitary gland, thyroid gland, diabetes mellitus, acute and chronic pancreatitis. The enzyme catalyzes the reduction of molecular oxygen to a superoxide radical, which is then converted into hydrogen peroxide and other toxic forms of oxygen. The assembly of the NADPH-oxidase complex is induced on the inner side of the neutrophil membrane [1; 4].

In our experiments it was found that under the conditions of experimental modeling of the state of mild hyperglycemia (6,5 mM), a direct dependence of the development of the activation effect of NADP oxidase on the time of incubation of neutrophils in a medium containing glucose is observed. This process is sequential in the form of a stepwise increase in activity and 60 minutes are necessary to achieve the activation maximum (2,34 times the control value).

The incubation of NP in the simulated conditions of moderate hyperglycemia (11 mM) leads to a significant activation of the NADP oxidase complex compared to the control in the first 30 minutes – 2,63 times. The further stay of NF in a medium containing 11 mM glucose (60 minutes) leads to an increase in enzyme activity with a maximum of 3,51 times the control value, with continued activity after 90 minutes and after 120 minutes of incubation.

When analyzing the obtained data on the experimental modeling of the state of hyperglycemia of small and medium severity it is obvious that an increase in the glucose concentration in the neutrophil precursor incubation medium correlates with an increase in the enzymatic activity of the NADP oxidase complex. The effect is dose dependent and has a maximum manifestation after 60 minutes of incubation of cells under conditions of hyperglycemia of both small and medium severity.

Massive entry of glucose into cells using the mechanisms of active and passive transport leads to activation of the processes of glycolysis and the Krebs cycle, oxidative phosphorylation in the mitochondria and leading to acceleration of the processes of cellular respiration and ATP synthesis, and also causing the phosphorylation of a number of key activation enzymes such as Ras protein and protein kinase C. Thanks to the activation of these enzymes, the phosphorylation of the components of the NADP oxidase complex, the main component of the farm system of the "respiratory explosion" and its faster assembly on the inner surface of the cytoplasmic membrane. All this leads to a rapid launch of a cascade of reactions leading to the formation of reactive oxygen species and the development of oxidative stress, which is one of the significant factors of damage in the pathogenesis of many diseases associated with the state of hyperglycemia [1–4].

BIBLIOGRAPHY

1. *Roit, A.* Immunology / A. Reut, J. Brostoff, D. Meil; trans. with English. – Moscow: The World, 2000. – 592 p.

2. *Klypa, T. V.* Hyperglycemia of critical states. Klypa, M. S. Orekhova, L. I. Zabrosaeva / Diabetes mellitus. – 2015. – Vol. 18, No. 1. – P. 33–41.

3. *Jeon, C. Y.* The role of pre-operative and post-operative glucose control in surgical-site infections and mortality / C. Y. Jeon, [et al.] // PloS one. – 2012. – Vol. 7, № 9. – P. 456–516.