The study of cellular metabolism in the formation of immunological memory is still relevant, as it can help to deepen our knowledge about the pathogenesis of immune-inflammatory diseases and provide a basis for improving their prevention and treatment.

**The aim** of this study is to investigate the activity of mitochondria in thymocytes and splenocytes after immunization of rats with human albumin.

**Materials and methods.** Male Wistar rats were immunized with human albumin for 4 days. The total amount of protein injected was 135 mg. Twenty-four hours after the last injection, we evaluated hematological parameters (general blood test) and mitochondrial activity of thymocytes and splenocytes using rhodamine 6 G fluorescence on the Evos M7000 imaging system in RFP mode. We also calculated the mass coefficients of the thymus and spleen relative to the body weight of the animals. Statistical analysis included calculation of the median, upper and lower quartiles, and comparisons of hypotheses using the Mann-Whitney U-test and correlation analysis according to Pearson's method.

**Results.** Hypertrophy of the thymus was detected in animals of the experimental group by 56.9%, p=0.032, and no changes in the mass of the spleen were observed. A decrease in mitochondrial fluorescence in thymocytes by 23.5% (p=0.037) and splenocytes by 13.7% (p=0.548), may be associated with the immunosuppressive effect of transforming growth factor beta during repeated administration of a foreign protein. At the same time, monocytosis exceeding the control by 59.4% (p=0.030), and thrombocytopenia by 20.8% (p=0.045), were observed in experimental rats, reflecting reactive changes occurring during immunization. Conclusion. Immunization of animals at the early stages is accompanied by inhibition of energy exchange in cells of the thymus and spleen. This may reveal features of the effect of inflammatory mediators on mitochondria of lymphocytes and identify promising targets for treatment of immuno-inflammatory pathologies.