

OBTAINING OF RECOMBINANT HUMAN INTERLEUKIN-7 AND THEIR USE FOR THE TREATMENT OF WOUND INFECTIONS

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In recent decades, there has been a tendency to increase significantly the weight of infectious diseases caused by *Pseudomonas aeruginosa* and *Staphylococcus aureus* strains. These pathogens are characterized by resistance to many antimicrobials, which causes high mortality from advanced sepsis. Thus, the study of the effect of recombinant human interleukin-7 (IL-7) as a concomitant therapy for wound infections is an important scientific task. On the other hand, the optimization of biosynthesis processes of recombinant medical proteins is a relevant task for biotechnology, especially from the point of view of technical and economic evaluation, since the release of the target products, especially when applying multi-stage procedures for the isolation and purification of proteins, affects the cost of their received medicines, accessibility. One of the ways to increase the yield of recombinant products is to optimize the composition of nutrient media. The aim of the presented work was to enhance the yield of recombinant IL-7 in *E. coli* by optimizing the quantitative and qualitative composition of the nutrient medium, as well as evaluation of the effectiveness of treatment of *P. aeruginosa* wound infection in mice by IL-7 preparation. The quantitative composition of the culture medium was optimized for the cultivation of a recombinant *E. coli* strain – producer of recombinant human IL-7. The determined rational ratio of organic and mineral components allowed increasing the yield of biomass by 1.4 times and the synthesis of rIL-7 by 1.3 times compared to the base composition. It was proved the stimulating effect of *Cliviaminiata* and *Zephyranthes grandiflora* extracts, as well as liposomal form of vitamin K1, as additives to the culture medium for the recombinant *E. coli* strain: in the range of 0.5-1.0% for phytoextracts and 15-25 mg/ml for vitamin K1. In general, with the addition of phytoextracts to the culture medium, the rIL-7 yield increased in 1.3-1.4 times, and with the addition of vitamin K1 the rIL-7 yield increased in 1.34-1.39 times. In 80% of experimental animals, which were, administered intraperitoneal IL-7, the healing of wounds and elimination of the pathogen of purulent inflammatory infection *P. aeruginosa* occurred on the 7th day. On the 9th day from the beginning of wound infection, wound healing and elimination of *P. aeruginosa* occurred in all experimental mice. In 60% of mice from the control group (did not receive treatment with IL-7), wound healing and the elimination of *P. aeruginosa* occurred on the 9th day. Wound healing and elimination of *P. aeruginosa* in all mice of the control group occurred on the 14th day. Thus, wound healing and pathogen elimination occurred 5 days earlier in mice treated with IL-7 than in mice from the control group (without IL-7 treatment). Therefore, IL-7 is a promising preparation for the treatment of complex wound infections.