

ANALYSIS OF PRODUCTION METHODS AND INDUSTRIAL METHODS OF STREPTOMYCIN PRODUCTION

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The *purpose* of the study: to analyze the methods of obtaining streptomycin.

Relevance of the study: streptomycin is a drug that is widely used in industry, so it is advisable to analyze the production of streptomycin.

Task: to analyze the methods of production and industrial methods of streptomycin production.

Streptomycin was discovered by Dr. Zelman Waxman in 1946. It got its name from the generic name of the actinomycetes *Streptomyces*, from which it was first isolated. In general, the producers of antibiotics in this group are actinomycetes and some species of bacteria of the genus *Bacillus*. They have bactericidal activity against staphylococci, a large number of GG - microorganisms and *Mycobacterium tuberculosis*[1].

Production of streptomycin began in late 1946. During the first year, about 1,000 kg were produced, and two years later - about 36 tons. To date, the production of this antibiotic is at least 300 tons per year. The increase in antibiotic production was carried out not only by expanding and increasing the number of industrial enterprises, but also through measures such as:

- 1) obtaining the most active strains of streptomycetes - producer of streptomycin,
- 2) selection of the most favorable environments and other conditions of cultivation of the producer providing high biosynthesis of streptomycin,
- 3) development of the most rational methods of isolation and purification of antibiotics [2].

Obtaining the most active strains of streptomycetes - producer of streptomycin. Selection of the most productive strains of *S. griseus* strains is one of the primary tasks in increasing the yield of streptomycin. If previously just isolated strains of the producer of streptomycin formed no more than 50 -100 µg/ml of antibiotic, now obtained strains that produce up to 20,000 µg/ml of streptomycin. In industrial conditions, strains are used - capable of synthesizing up to 10-20 thousand µg / ml of antibiotic [2].

Thus, only due to the selection of antibiotic products, the productivity of these strains compared to the original increased by 100-200 times. Induced mutagenesis and stepwise selection play an important role in the selection of streptomycin producers. Mutagenic factors are widely used to obtain mutants: X-ray ultraviolet radiation. Typically, to obtain mutants with increased formation of streptomycin using the method of repeated irradiation of the spores with streptomycetes ultraviolet light with bringing the total dose to 10,000-20,000 erg/mm², followed by the use of visible light. The result was new strains that retain high antibiotic activity.

Reference:

1. Wainwright M. Streptomycin: discovery and resultant controversy. *Hist Philos Life Sci.* 1991. Vol. 13 (1). P. 97–124.
2. World Health Organization. Critically important antimicrobials for human medicine, 6th revision. Geneva: World Health Organization. 2019. 45 p.