1. Microorganisms of different soil types
2. Nutrition of microorganisms
3. Phytopathogenic microorganisms
4. Fungi that cause damage to industrial products, materials, structures
5. Physiologically active substances of fungi (enzymes, antibiotics, toxins)
6. Nitrogen-fixing activity of microorganisms
7. Conversion of nitrogen-free organic substances by microorganisms
8. Disease-causing microorganisms
9. Microorganisms that can fix molecular nitrogen
10. Aerobic respiration
11. General characteristics of sanitary-positive microorganisms
12. Basic provisions of sanitary rules of occupational health in biotechnological production
13. Genetically engineered products
14. Problems of foreign gene expression
15. Principles of constructing a risk assessment procedure for genetically engineered activities
16. Vectors based on DNA-genomic viruses
17. Biosafety of genetically engineered activities
18. Ethical aspects of human stem cell research
19. Genetic engineering in the production of pharmaceuticals and medicines
20. Phage and cosmode vectors
21. Restriction enzymes
22. Prospects and achievements of plant genetic engineering
23. Immobilized plant cells
24. Suspension cultures of plant cells
25. The application of clonal micropropagation and its prospects
26. Heterogeneity of cultured plant cells
27. Totipotency of a plant cell
28. Directions and possibilities of using isolated plant tissue culture
29. Features of callus cells
30. Morphogenesis in callus tissues
31. Somatic embryogenesis
32. Plant growth regulators in seed production
33. Functions of proteins in the human body. Physiologically active peptides
34. Compound proteins. Classification, structure, examples. Structure and function myoglobin
35. Cofactors and coenzymes. Classification and nomenclature of enzymes
36. Fundamentals of kinetics of enzymatic reactions
37. Structure of biological membranes
38. Endocytosis and exocytosis: biochemical mechanisms
39. Embryoculture: methods, challenges, and perspectives
40. Fundamentals of the vital method in biotechnological research
41. Evaluation, selection and selection of spermatozoa
42. Cultivation of gametes in vivo: methods and features
43. Cultivation of embryos in vitro: methods and features. Nutrient medium mode in the cultivation of embryos in vitro
44. Cultivation of embryos in vivo
45. Structure of DNA molecule: chemical composition of monomer links of DNA molecule, 5'-3' phosphodiester bond, complementary base pairs; bonds holding two polynucleotide chains together; stacking-interaction
46. Topoisomerases of types I and II, their mechanism of action
47. Nucleosomal structure of chromatin. Euchromatin and heterochromatin
48. Characterization of E. coli DNA polymerases: size, subunit composition, enzymatic activities, and participation in replication and repair processes
49. Direct repair of thymine dimers, alkylated bases, and single-strand breaks in a DNA molecule
50. Excisional base reparation
51. Methods for determining the composition and activity of soil microorganisms
52. Microbiological method of plant protection
53. Microbiological analysis of air media - sedimentation method
54. Microbiological analysis of water and soil media - by dissolving method
55. Preparation of nutrient media for cultivation and inoculation of microscopic fungi
56. Microscopy of lactic acid bacteria
57. Determination of the qualitative composition of bacteria
58. Microscopy of oil-acid bacteria
59. Biological fixation of atmospheric air
60. The isolation of pure cultures of bacteria
61. Risk assessment of genetically engineered activities
62. Methods to ensure that foreign microflora does not enter the production process
63. Chemical-enzymatic gene synthesis
64. Genomic fingerprinting
65. Amplification of DNA fragments by polymerase chain reaction (PCR)
66. Creating genomic libraries
67. Dideoxynucleotide DNA sequencing method
68. Phosphoramidite method of DNA synthesis
69. Methods for producing polyketide antibiotics
70. Wastewater treatment systems for biotechnological productions
71. Assessment of the sanitary and microbiological state of the environment of biotechnological production facilities
72. Preserving the gene pool of plants by biotechnology methods
73. Accelerated clonal micropropagation of plants
74. Plant protection against viral diseases
75. Stages of the technology of obtaining secondary substances of plant origin
76. Obtaining virus-free planting material
77. Protoplast isolation
78. Composition of nutrient media for plant cultivation
79. In vitro preservation of plant gene pool. Cryopreservation
80. Methods of transferring genes into plants
81. Protoplast fusion
82. Cultivation of protoplasts
83. Transmembrane signal transmission
84. Catabolism and anabolism, a general scheme of metabolism and energy in the human body
85. The tricarboxylic acid cycle. General scheme, energetic significance
86. Oxidative phosphorylation of ADP
87. Composition, structure and nomenclature of respiratory complexes and other components of the electron transport chain, their localization and functions in the inner mitochondrial membrane
88. Physiological significance of free-radical oxidation
89. Extracorporeal fertilization in animal husbandry: significance, prospects and peculiarities
90. Factors that ensure the successful fertilization of gametes in vitro. Methods of sex regulation
91. Fertilized and unfertilized oocytes: characteristics, peculiarities and differences
92. The significance of the in vitro gamete fertilization method for animal husbandry, biology and medicine
93. Embryo leachability: age and stage of development of extracted embryos
94. Biological integrity of embryos
95. Structure of the replication fork: events on the leading and lagging strands. Semi-continuous synthesis and Okazaki fragments
96. Characteristics of eukaryotic DNA transposons: structure, movement mechanism, representatives
97. Features of E. coli RNA polymerase structure: cor-enzyme and holoenzyme, role of individual subunits
98. The main properties of the genetic code. Peculiarities of the code dictionary
99. Codon and anticodon, principles of their interaction. The principle of non-strict conformity
100. Families of homologous genes. Orthologues and paralogues