DEVELOPMENT OF CITRATE DRY RABBIT PLASMA SEPARATION TECHNOLOGY

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Relevance: Blood plasma is a valuable biological fluid that contains many proteins, immunoglobulins, coagulation factors, and biologically active substances. Rabbit plasma is widely used in the pharmaceutical, biotechnology, and diagnostic fields. To ensure its stability during long-term storage and transportation, it is necessary to obtain plasma in a dry form.

Purpose of the Study: The purpose of this research is to develop a technology for extracting plasma from rabbit blood using citrate and to obtain it in a stable, long-term dry form through lyophilization (freeze-drying). Additionally, the study aims to evaluate the degree of preservation of the biologically active properties of the obtained plasma.

The specific objective is to develop a technology for producing citrated dry rabbit plasma and to investigate its potential use in the detection of Staphylococcus aureus. This includes:

- Creating a stable, dry form of plasma suitable for long-term storage;
- Developing an effective diagnostic reagent for the coagulase test;
- Providing a theoretical basis for a technological solution applicable to the rapid and reliable detection of staphylococcal infections.

Methods and Techniques: The research combines both experimental and theoretical approaches. In developing the technology for obtaining dry plasma, scientific literature, existing biotechnological processes, and data related to the stability of biologically active substances were analyzed.

Methodological Approaches:

- Preparation of biological material
- Extraction method
- Stabilization methods
- Drying technology
- Control and evaluation methods

Thus, the "Methods and Techniques" section outlines the main scientific and methodological approaches used in the development of the technology: blood collection - plasma separation - stabilization - drying - quality control - storage.

Stages of Plasma Separation:

1.Blood collection and anticoagulation - Sodium citrate is added to rabbit blood to prevent clotting.

2.Centrifugation - Erythrocytes, platelets, and leukocytes are sedimented, leaving plasma as the upper layer.

3. Preparation for drying - Plasma undergoes necessary filtration and sterilization.

4. Drying (lyophilization) - Frozen plasma is sublimated under vacuum and converted into a dry state.

5. Packaging and storage - Dry plasma is sealed in hermetic containers and stored under controlled temperature conditions.

This technology makes it possible to preserve plasma proteins, coagulation factors, and biologically active substances to the maximum extent. As a result, citrated dry rabbit plasma can serve as an important raw material for diagnostic tests, scientific research, and pharmaceutical preparations.

Results: A theoretical technological scheme for obtaining citrated dry rabbit plasma was developed. Lyophilization was justified as the most effective method for stable plasma preservation. It was theoretically demonstrated that reconstituted dry plasma retains its coagulation properties. The study proposed its use as a diagnostic reagent for the coagulase test to detect Staphylococcus aureus. Furthermore, physicochemical, biological, and microbiological quality control criteria for plasma were defined. The technology provides prospects for creating a convenient diagnostic reagent that can be stored long-term.

Conclusions: The technology for producing citrated dry rabbit plasma has been theoretically developed, and its advantages as a diagnostic reagent have been substantiated. Lyophilization (low-temperature drying) has been identified as the most optimal technology for preserving plasma proteins and coagulation factors. Since dry plasma retains its coagulation properties after reconstitution, it can be effectively applied in the detection of Staphylococcus aureus through the coagulase test. The technology expands opportunities for long-term storage, transportation, and practical use of the reagent in diagnostic laboratories.