



STRUCTURE OF THE MICROBIOLOGICAL LABORATORY, STRUCTURE OF BACTERIA, METHODS OF THEIR STUDY

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Abstract

This article is devoted to the immune system and its role in protecting the body from infections. The main mechanisms of innate and adaptive immunity are considered, as well as the historical development of methods for the prevention and treatment of infectious diseases since the beginning of the 20th century. The article discusses the prospects for the future development of immunology and its significance in future medicine.

Keywords: Innate and acquired immunity, viral and bacterial infections of children, acute bacterial intestinal infections.

Introduction

Bacteriological, virological and serological laboratories are organized as part of the republican, city, district special medical and preventive hospitals, in large medical and preventive hospitals and medical institutes (for training students). Bacteriological laboratories consist of complex rooms and special equipment, devices, and are intended for conducting examinations using bacteriological methods.

Bacteriological laboratories within the city and district medical and preventive hospitals carry out the following examinations:

- ❖ bacteriological diagnostics of infectious diseases;
- ❖ identification and diagnosis of bacterial carriers;
- ❖ sanitary bacteriological assessment of water bodies and drinking water;
- ❖ sanitary bacteriological examination of soil;
- ❖ sanitary bacteriological examination of the air and sanitary condition of residential and medical and preventive institutions;



- ❖ sanitary bacteriological examination of food products;
- ❖ sterility and disinfection qualities of medical materials are regularly checked.

Bacteriological laboratories will also be established in large city-level medical and preventive hospitals. In the bacteriological laboratories of these medical and preventive hospitals, examinations will be carried out for the diagnosis of infectious diseases of groups 3 and 4 (intestinal, airborne, purulent infections). At the same time, when assessing the sanitary and hygienic condition of the hospital, sterilization and disinfection qualities will be regularly checked. In addition, laboratories for “Extremely dangerous infectious diseases” (plague, brucellosis, anthrax, tularemia, etc.) will be established at the republican and regional levels. In these laboratories, pathogens of extremely dangerous infectious diseases will be identified and diagnosed.

Bacteriological laboratories are also organized in specialized medical hospitals (tuberculosis, skin and genital diseases) and research institutes at the republican and city levels. Virological laboratories are organized as part of the republican, city, regional DSENMs and at the Research Institute of Virology. In these laboratories, diseases caused by viruses (influenza, poliomyelitis, measles, etc.), chlamydia (ornithosis, etc.), and diseases caused by varicoceles (scarlet fever, KU fever, etc.) are diagnosed. When organizing and equipping virological laboratories, special boxes are provided for working with viruses, cell cultures, chicken embryos and laboratory animals, taking into account the requirement for strict aseptic conditions. The structure of the bacteriological laboratory includes: - rooms intended for bacteriological examinations; utility (additional rooms). Rooms intended for bacteriological examinations are divided into 2 zones (zones) depending on the level of risk to employees: I. “Infectious” zone - in these rooms employees work with pathogenic biological agents and pathogenic bacteria may be stored, therefore, in this zone employees use appropriate protective clothing. II. “Clean” zone - in these rooms employees do not work with biological materials and can walk in their own clothes. Depending on the scope and objectives of the work, laboratories should have the following rooms intended for bacteriological examinations, namely:

- a) a room for receiving, registering and giving answers to pathological materials brought to the laboratory;

b) rooms for working with certain groups of bacteria (intestinal, airborne, sanitary, etc.);

d) a room for conducting serological tests.

At the same time, a special box with a window is equipped in one of the rooms - for working in aseptic conditions, there is a vestibule (pre-box) in the boxing room. A table, chair, equipment for inoculating pathological materials and bactericidal lamps are placed in the boxing room. A cabinet and a thermostat can be placed in the vestibule for storing sterile materials. Windows and doors of rooms in the “infectious” zone must be hermetically sealed. The “infectious” zone must be separated from other ventilation systems and special ventilation devices must be installed for this zone. Utility and additional rooms:

- ❖ autoclave or sterilization room - a room for decontamination of used biological materials, contaminated containers;
- ❖ washing room - equipment for washing containers; ❖ bacteriological kitchen - for preparing, pouring, sterilizing and storing food for growing bacteria;
- ❖ vivarium - for keeping laboratory animals intended for experiments;
- ❖ material rooms - for storing spare reagents and laboratory containers, equipment, instruments and household items.

In addition to the above rooms, virological laboratories must also have separate boxes for special processing of the material to be examined and for working with cell cultures.

Modern large laboratories have computer programs for identifying (sorting) bacteria. At the same time, serological and virological laboratories need equipment for immunoenzyme, immunoblotting tests. The laboratory will have a separate area for staining microscopic preparations. There are stain solutions, alcohol, acids, reagents, filter paper, etc. There are gas or alcohol burners and glass containers with disinfectant solutions at each workplace. For daily work, the laboratory should have a sufficient amount of nutrient media, chemical reagents, diagnostic preparations, and other necessary items.

Bacteriological, virological and serological laboratories should currently be equipped with the following modern instruments and equipment, namely: biological and additional equipment (illuminating, phase-contrast) luminescent, electron microscopes, thermostat, anaerobic, sterilization equipment (autoclave, drying, sterilization cabinet), water bath, pH meters, distilled water preparation



equipment (distiller), centrifuges, technical, analytical scales, filtering equipment (Seitz filter, etc.), refrigerators, apparatus for preparing cotton-gauze plugs, a set of instruments (bacteriological tubes, spatulas, needles, tweezers, automatic micropipettes, etc.), laboratory utensils (test tubes, flasks, Petri dishes, mattresses, vials, ampoules, Pasteur pipettes and designated pipettes), etc.

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