Laboratory testing of cellular immunity

The **aim of laboratory methods of cellular immunity testing** is to determine the basic cells involved in the immune response. Peripheral blood is collected and immunohistochemical methods are used.

Morphological tests

Using the blood count, we determine the basic cells, their morphological defects and numbers. We are most interested in T-lymphocytes and B-lymphocytes, respectively. about their subpopulations (they differ in membrane surface features). The detection principle is based on fluorometry and fluorescence. T-lymphocytes have a marker CD3, so we bind monoclonal antibodies against CD3 and label them with fluorochrome, wash and bind bound:

- **microscope**: laborious, demanding, burdened with subjective error,
- **flow cytometer**
- **immunohistochemically:** ELISA,
- **PCR**: in immunology based on reverse transcription; we need to obtain mRNA that is present in a situation where a certain mediator is reproduced,
- **in situ hybridization:** we detect mRNA and DNA directly in cells; similar PCR; whether a certain type of mediator is produced and how many; detection of genes in cells in microscopic imaging (we can directly see what each cell produces).

Functional tests

Assays that detect the function of individual cell types are also used.

Cytokine secretion assays:

We detect our own antigen (cytokine) immunohistochemically or cytometrically. TH2-lymphocytes produce mainly IL-4. They do not have a characteristic membrane feature.

Antigen proliferation assays:

The degree of ability to proliferate using mitogens (eg pokeweed). We detect the growth of the cell population cytometrically or by incorporation of radioactive thymidine, we measure radioactivity (the more thymidine, the greater the proliferative activity).

Functional test of neutrophil activity:

The leukocyte suspension is mixed with yeast or particles and the phagocytosis capacity is monitored. Intracellular killing mechanisms can also be monitored. We measure the oxidative activity of cells in suspension (color change, photon release), the activity of enzymes. The number of phagocytic particles can also be detected.

Links

related articles

- Defects in cellular immunityDefects in cellular immunity
- Non-specific immunity ■ Specific immunity
- T-lymphocytes ■ B-lymphocytes ■ Makrofágy ■ Neutrophils ■ CD

References

- HOŘEJŠÍ, Václav a Jiřina BARTŮŇKOVÁ. *Základy imunologie.* 3. vydání. Praha : Triton, 2008. 280 s. ISBN 80-7254-686-4.