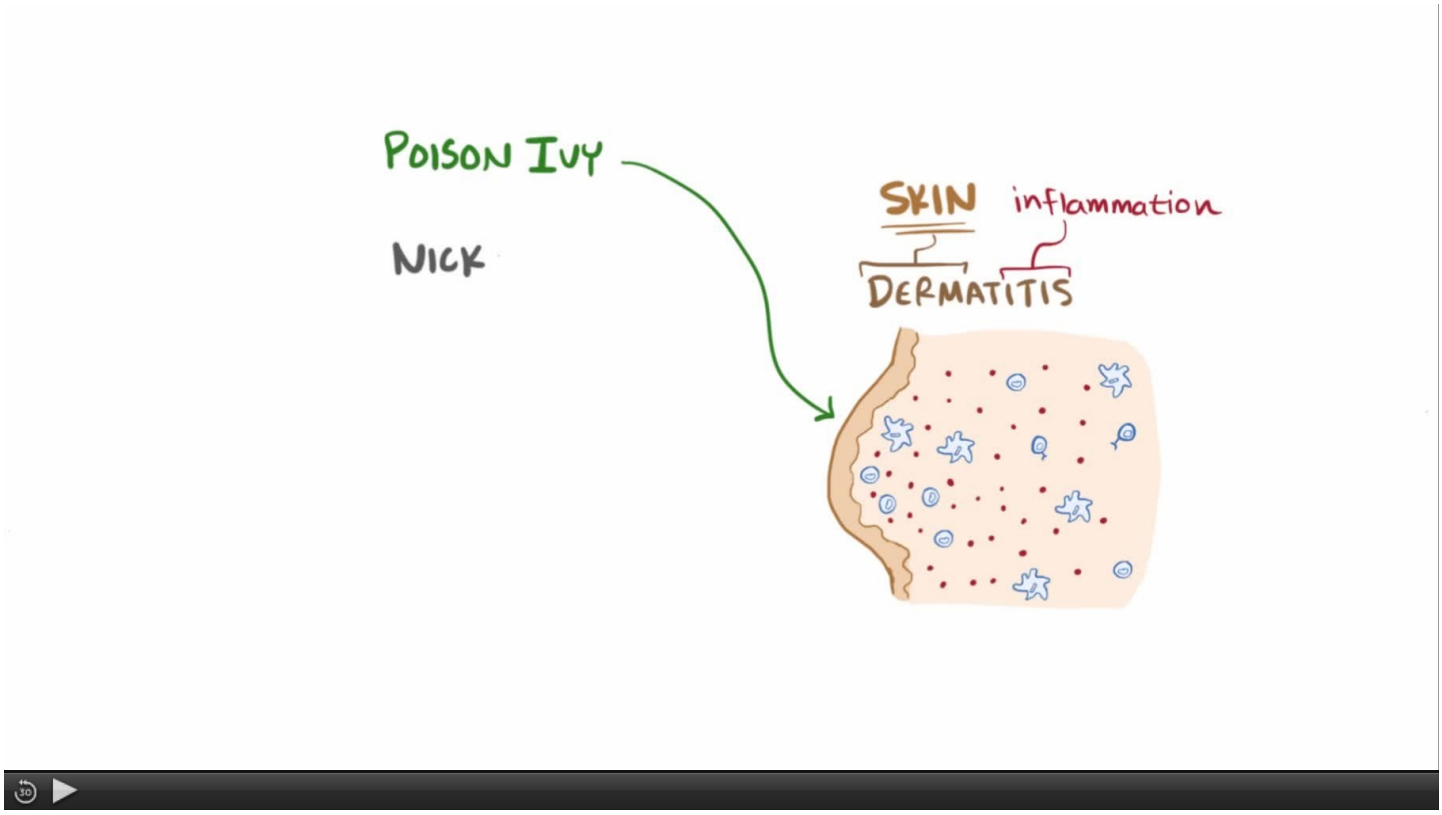
# Immunopathological reaction IV. type

**A late-type immunopathological reaction** (ie, a type IV reaction, late type, cellular) occurs 12-48 hours after exposure to allergen. There are no free Ig in the serum, the reaction is mediated by T-lymphocytes.

## Cellular immunopathological reaction (tuberculin type)

*Delayed type hypersensitivity* ***is also sometimes referred to as*** *DTH* (delayed type hypersensitivity).

The local reaction is caused by inflammationleft response dependent on TH1-lymphocytes, monocytes and macrophages. **Experimentally,** *the animal is immunized intradermally with antigen in a suitable adjuvant. This promotes the increase of TH1-lymphocytes. After several weeks, the antigen is again injected intradermally and within 24 to 72 hours a characteristic local reaction occurs at the injection site. The time delay is caused by the fact that TH1-lymphocytes and macrophages, which stimulate each other, must first migrate to the injection site. A hard swelling (*induration*) occurs. Under physiological circumstances, this reaction is directed against intracellular parasites. Allergens are bacteria, fungi, viruses and their products. The main changes occur in the corium, most often manifesting as a papule.* ***During long-term stimulation***, macrophages can change into multinucleated syncytia, so-called *giant cells*. Dermatological manifestations are "id" reactions - mycides, microbides, bacterids, tuberculids. **DTH** is the essence of the tuberculin reaction*, which we detect the state of immunity against TB. Delayed hypersensitivity mechanisms are responsible for tissue damage during* ***TB***andleprosy**.** Granuloma often occurs, and in extreme cases, **caseous necrosis** (see necrosis). Some autoantigens cause this type of reaction in sarcoidosis or granulomatous vasculitides. Infiltration of TH1-lymphocytes with production of IFN-γ is characteristic of **demyelinating autoimmune disease.**




## Cellular cytotoxic reaction (eczema, epidermal, contact type)

Reaction similar to **DT**', *but TH1-lymphocytes activate other effector components, especially CD8+ T-lymphocytes. Infected or altered cells are lysed by cytotoxic T-lymphocytes.* ***It occurs in*** *viral exanthemsand tissue damage caused by some* ***viruses, in*** *hepatitis* the main liver damage is caused by the immunopathological action of TC- and TH1 - lymphocytes. They **attack and destroy** ***infected hepatocytes. T****hey are also used in* ***"acute rejection"*** *of a transplanted organ, in some forms of* ***"autoimmune thyroiditis"****. The same mechanisms are responsible for contact dermatitis* ***induced by certain chemicals (*** **(nickel, chromium, cosmetic product ingredients and others). The dermatological manifestation has the character of eczema with spongiosis in the dermis and lymphocytic infiltrates.**

## Foreign body reaction

The reaction is similar to DTH, but occurs to a non-antigenic foreign material. Hydrophilic materials show better biocompatibility:

- contact lenses;
- joint replacements;

- breast implants;
- sewing material;
- dialysis membranes;
- vascular replacements...

**Depends on biocompatibility*. Proteins from the blood plasma are*** *adsorbed* on them. Adsorbed proteins are recognized by receptors of monocytes, macrophages, and platelets. Adhered monocytes become activated, express some receptors. Macrophages create **syncytia**, producing IL-1, TNF. These effects create local and systemic reactions.

In **silicosis, asbestosis, beryliosis** inhaled particles are deposited in the lungs, stimulating alveolar macrophages. Granulomas are formed, fibroblasts are stimulated, leading to pulmonary fibrosis. In the case of asbestosis, **carcinogenic effect of asbestos** is added.

# Links

## Related Articles

- Allergy
- Immunopathological reaction type I
- Immunopathological reaction II. type
- Immunopathological reaction III. type

## External links

- Immunopathological reaction IV. type - Youtube video (https://www.youtube.com/watch?v=C3E5COZ1XC8)

## References


- HOŘEJŠÍ, Václav – BARTŮŇKOVÁ, Jiřina. *Základy imunologie.* 3. edition. Triton, 2008. 280 pp. ISBN 80-7254-686-4.