Topics

• Type III hypersensitivity
• Type IV hypersensitivity

Type III hypersensitivity

• Immune complex – mediated
• Activates complement
• Inflammation

Figure 18.5 Immune complex - mediated
Type IV hypersensitivity

- Delayed cell – mediated
- Tuberculin skin test
- Contact hypersensitivities
- Infectious diseases

Delayed cell - mediated

- Delayed hypersensitivity
- Sensitized T lymphocytes

**TABLE 18.3 Pathogenesis of Immune Complex Disease**

1. Antibody combines with excess soluble antigen.
2. The antibody-antigen combination reacts with complement.
3. Complexes are deposited in sites such as skin, kidney, and joints.
4. Fragments of complement cause release of histamine and other mediator substances from mast cells or basophils and also attract neutrophils.
5. Release of the mediators causes increased permeability of blood vessel walls.
6. Immune complexes penetrate or form in blood vessel walls.
7. Neutrophils enter the vessel walls chemotactically.
8. Neutrophils release lysosomal enzymes, especially proteases, that induce tissue injury.
Figure 18.6 Tuberculin skin test

Figure 18.7 Contact hypersensitivities

Figure 18.8 Severe contact hypersensitivity
Infectious disease

- Protective function cause tissue damage
- Ex. Leprosy, tuberculosis, leishmaniasis, herpes simplex

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Type I hypersensitivity</th>
<th>Type II hypersensitivity</th>
<th>Type III hypersensitivity</th>
<th>Type IV hypersensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell type reactive</td>
<td>B cells</td>
<td>B cells</td>
<td>B cells</td>
<td>T cells</td>
</tr>
<tr>
<td>Type of antigen</td>
<td>IGE-mediated</td>
<td>IGE-mediated</td>
<td>Immune complexes</td>
<td>Delayed cell-mediated</td>
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<tr>
<td>Type of antibody</td>
<td>IgE</td>
<td>IgG, IgE</td>
<td>IgG, IgM</td>
<td>N/A</td>
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<td>Effector cells involved</td>
<td>Mast cells, basophils</td>
<td>Neutrophils, eosinophils, macrophages, T cells</td>
<td>Immune complexes</td>
<td>CD4+ T cells</td>
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<tr>
<td>Mediators</td>
<td>Histamine, serotonin</td>
<td>Complement, cytokines, antibodies</td>
<td>Complement, cytokines</td>
<td>Cytokines</td>
</tr>
<tr>
<td>Type of hypersensitivity</td>
<td>Immediate, up to 24 hours</td>
<td>Immediate, up to 24 hours</td>
<td>Anaphylaxis, serum sickness</td>
<td>Arthritis</td>
</tr>
<tr>
<td>Site of reaction</td>
<td>Skin, mucous membranes</td>
<td>Skin, mucous membranes</td>
<td>Skin, mucous membranes</td>
<td>Skin, joints, connective tissue</td>
</tr>
<tr>
<td>Examples</td>
<td>Anaphylactic shock, hives, angioedema</td>
<td>Immediate hypersensitivity reactions</td>
<td>Anaphylaxis, serum sickness</td>
<td>Reactions, joint pain</td>
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