

# Complement system

**The complement system** consists of about 30 serum and membrane proteins and is part of a non-specific humoral immune response. The components of complement are cascading and thus trigger an immune response.

The main components are 9 serum **proteins C1-C9**, as well as factors (B, D, P), inhibitors and inactivators (H, I). Most are synthesized in the liver, others in macrophages and fibroblasts. Various stimuli trigger a cascading activation of the individual components.

The central component is **C3** (the C3b fragment covalently binds to the microbial surface). The intermediates of this cascade reaction have significant biological functions, such as opsonization and chemotaxis. The terminal product of the cascade is a complex of proteins **C5b, C6, C7, C8, C9** called **MAC** (*membrane attack complex*). It perforates the cytoplasmic membranes of some cells and causes their lysis, killing them.

## The main functions of complement

- **Opsonization** (*C3b*): complement is activated upon bacterial entry; component 3a is released into the blood stream, 3b opsonizes,
- **Chemotaxis** (*C3a, C5a*),
- **Pro-inflammatory functions** (*C3a, C5a*): anaphylatoxins (mediators of inflammation, cause vasodilation, increase the permeability of blood vessel walls by releasing histamine)
- **Osmotic lysis** (*C5b - C9*): cytotoxic action of the membranolytic complex

There are specific receptors for activated C3, C5 components. **The CR1-receptor** occurs on erythrocytes and serves to transport the immunocomplex into the spleen from tissues. The immunocomplex activates complement and binds to the B component receptor and is then removed in the spleen. **Immunopathological conditions** occur when this function is impaired.

Some components of the complement system are important in other processes. C3dg-containing immunocomplexes stimulate lymphocyte activation. Immunocomplexes with **C3b** regulate antigen transport to the spleen and nodes. Some complement receptors serve as **adhesive molecules**.

Complement inhibition inhibits hemostasis × injury activates both systems simultaneously (hemostasis prevents other parts from entering the system).

## Complement activation

There are three ways:

1. Alternative pathway
2. Lectin pathway
3. Classic pathway

The lectin pathway is a classic variant.

## Links

### Related articles

- Alternative pathway
- Lectin pathway
- Classic pathway

### External links

- Complement (Wikipedia) ([https://en.wikipedia.org/wiki/Complement\\_system](https://en.wikipedia.org/wiki/Complement_system))
- Complement (Youtube video) (<https://www.youtube.com/watch?v=2-57bqFSJ1E>)

## Reference

### References

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