

# Superantigen

A superantigen is an exoantigen, usually a product of infectious microorganisms, that induces non-specific activation of a large number of lymphocytes regardless of their antigenic specificity; microbial substances causing inflammation activate the system non-specifically (atopic eczema). They do not require processing by antigen presenting cells to activate the immune system.

Superantigen (SAg) combining TCR and HLA II. class

These are microbial products with two binding sites:

- one binds to an epitope present on all HLA II molecules. class ( $\beta$ -domain);
- the latter bind to structures shared by many different TCR ( $\beta$ -domain) regions.

They bind to the T-cell receptor at another site (slightly non-specifically) and thus also stimulate it. This leads to stimulation of a number of T-clones (non-specific polyclonal T-cell activation) and pathological activation of inflammation. Superantigens give a signal leading to rapid T-cell activation, secretion of a number of cytokines. They can also cause shock conditions. Some superantigens are membrane proteins anchored on the surface of APCs (products of some oncogenic retroviruses), others are soluble toxic products (eg staphylococci).

## Consequences of superantigen exposure

- Immunomodulatory effect - after binding, they induce an overall defense response, activating a huge number of cells regardless of antigen specificity.
- Polyclonal activation, cytotoxic activity, increased amount of CD4, CD8, B-lymphocytes, macrophages, NK cells, cytokine release.
- Production of large amounts of cytotoxins, death of many immune cells, unnecessary production of non-protective autoimmune antibodies.
- Apparently responsible for the development of some autoimmune diseases.
- they increase susceptibility to endotoxin (risk of simultaneous infection with G- bacteria).

## Soluble superantigens

- S. aureus toxic shock syndrome enterotoxin and toxin;
- pyrogenic toxins Str. pyogenes;
- mycoplasma superantigens,
- pseudomonads;
- enterotoxin Clostridium perfringens.

## Cell-bounded superantigen

- M protein Str. pyogenes;
- Mycobacterium tuberculosis component;
- Yersinia enterocolitica

## Links

## Related Articles

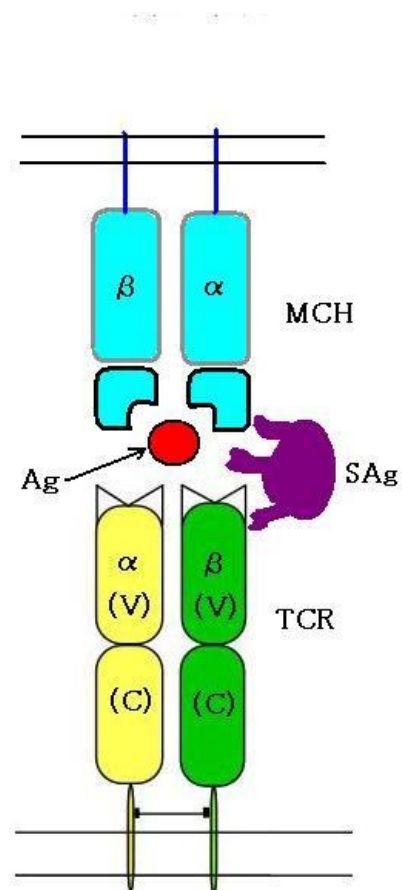
- Antigen
- Bacterial toxins

## References edit

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

## Source

- JANSKÝ, Petr. *Zpracované otázky z mikrobiologie* [online]. [cit. 2012-01-30]. <[https://www.yammer.com/wikiskripta.eu/uploaded\\_files/3804405](https://www.yammer.com/wikiskripta.eu/uploaded_files/3804405)>.



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