

Immune defense against extracellular bacteria

Defense against extracellular bacteria depends on well-functioning mechanisms of phagocytosis, functional antibodies, complement, and intracellular killing.

- In particular, opsonization with complement components , lectins and antibodies is required to eliminate bacteria . The final elimination is most often provided by neutrophils .
- Absorbed bacteria are killed intracellularly by **oxidative products of NADPH-oxidase** (so-called oxidative flare -up), or by some **oxygen-independent mechanisms** (lysosomal proteases, nucleases, lipases, lower pH).
- Cytokines produced by phagocytes , such as interleukin-1, interleukin-6 , TNF , induce fever , metabolic response and increased acute phase protein synthesis .
- This is followed by stimulation of **antigen-specific** components of immunity , stimulation first of T-lymphocytes , then B-lymphocytes and IgM production . With the help of T-ly, there is an isotype rearrangement and the promotion of B-ly proliferation and the production of more affine IgG or IgA.

Encapsulated bacterial strains (e.g., pneumococcus) directly stimulate B cells by aggregating their BCRs and induce T-independent production of IgM antibodies; these, when bound to bacteria, activate the classical complement activation pathway .

Only **gram-negative** bacteria (eg Neisseria) are sensitive to the action of the complement membranolytic complex .

Some bacteria produce **toxins** . Neutralizing antibodies are crucial protection.

IgG and IgA memory antibodies remain in the body after infection , which have a protective role. Memory T and B cells rapidly activate upon further infection and initiate an anamnestic antibody response (secondary immune response).

Links

Related articles

- Immune defense against multicellular parasites
- Immune defense against intracellular bacteria and fungi

References

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

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