Immune defense against intracellular bacteria and fungi

'Defense against intracellular bacteria and fungi' may not always be effective.

- Some infectious agents may multiply in "phagosomes" by "[phagocytosis | phagocytosis]], which they induce, by multiplying in the" phagosomes "mechanism and escaping and multiplying directly in the cytoplasm.
  - Among bacteria, let's name genera
    - *Mycobacteria, Listeria, Brucella* ,
    - also some yeasts and fungi (*Candida albicans, Aspergillus* etc.).

Macrophage uptake leads to the production of *' IL-12'* , which leads the differentiation of T-lymphocytes precursors to the *'T_{H1}'*. These increase the activity of macrophages and their cytolytic mechanisms (induce the production of ROS and RNS) by IFN-γ; and TNF. Antibodies of the class *'IgG_2'* also contribute to the activation of macrophages. These are synthesized by plasma cells under the influence of other cytokines. When microbes are able to penetrate into the cytoplasm of an infected cell ("Listeria"), "cytotoxic T-lymphocytes" act against them, which recognize complexes of peptide fragments of bacterial proteins with HLA class I. on the surface of the infected cell.

Individuals with phagocytosis disorders and cytotoxic T-cell defects are at increased risk for intracellular parasite infections.

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Literature

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