

# Host-microbe relationship

## Relationships of organisms

**Symbiosis** - the coexistence of two or more different organisms.

- Endosymbiosis x ectosymbiosis
- Symbiont - any microorganism that shares at least part of its life with another organism
- **Three forms of symbiosis:**
  1. **commensalism** - benefits the commensal and does not harm the host (normal intestinal flora)
  2. **mutualism** - both partners benefit (*Escherichia coli* and production of vitamin B12 and K, and making colonization by pathogens more difficult)
  3. **parasitism** - the organism harms the host - directly or just deprives it of nutrients - intracellular parasites, ectoparasites (lice), endoparasites (tapeworms)

### Parasite and saprophyte

- **A parasite** is an organism that at least sometimes requires another living organism
- **Saprophyte** - a microbe does not need another organism, it only needs non-living organic matter
  - Pathogenic saprophytes - *Clostridium botulinum*, *Histoplasma capsulatum*

## Infection

**There are several definitions** for the term infection or contagion:

1. The presence of a microorganism in a particular host.
2. The penetration of an infectious agent into an organism, multiplication inside and adverse effects on its surfaces (in contrast to this stands colonization - colonization by a non-pathogenic or pathogenic microbe without disease symptoms).
3. Conflict between a microbe and its host (even in asymptomatic infection).

### Process of infection

The process and severity of infection can be influenced by several factors:

#### By the microbe

- pathogenicity;
- virulence;
- infectious dose.

#### From the macroorganism

- degree of non-specific resistance - overall fitness, genetic factors (population resistance);
- specific immunity - primary, secondary reactions;
- age, nutrition, lifestyle.

#### Other circumstances

- Environmental influences (e.g. seasonal variations - respiratory infections in cold weather),
- gateway infection (e.g. tularemia).

### Stages of infection

1. Incubation period;
2. period of prodromal symptoms - non-specific symptoms;
3. typical syndrome;
4. recovery - relapse may occur;
5. relapse - after recovery.

### Forms of infection

#### According to manifestations

1. Inapparent.
2. Manifest.
  - Subclinical - non-characteristic symptoms.
  - Abortive - poorly expressed symptoms.
  - Clinical form of infection - all symptoms expressed.

#### According to the range

1. Local (possibly also focal).
2. Systemic (sometimes referred to as massive) - when it affects the whole system or a substantial part (e.g. influenza, pulmonary TB, meningitis, pyelonephritis...).
3. Generalized (regularly e.g. typhoid fever, spotted fever, most exanthematous viruses).

#### According to the course

1. Acute (days).
2. Subacute (months).
3. Fulminant (violent).
4. Chronic (years).
  - Asymptomatic chronic infections.
    - Mainly viruses, bacteria - *Rickettsia prowazekii*, *Chlamydia trachomatis*, *Salmonella typhi*, *Mycobacterium tuberculosis*.
      1. Persistent - agents present in an infectious detectable form.
      2. Latent - in the body in a non-infectious form.

## References

### Related articles

- Pathogenicity and virulence of bacteria

### Sources

- JANSKÝ, Petr. *Zpracované otázky z mikrobiologie* [online]. [cit. 2012-02-01]. <[https://www.yammer.com/wikiskripta.eu/uploaded\\_files/3804405](https://www.yammer.com/wikiskripta.eu/uploaded_files/3804405)>.
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