

# Gram-negative anaerobic bacilli and cocci

Bacteria from the group Gram-negative anaerobic bacilli and cocci are difficult to cultivate, so it is problematic to identify them as the causative agent of the disease. We include clinically important genus ***Bacteroides***, ***Prevotella***, ***Fusobacterium***, ***Mobiluncus*** and ***Veillonella***.

## Gram negative anaerobic bacilli

Anaerobic G<sup>-</sup> bacilli are part of the natural bacterial flora, often acting as opportunistic pathogens. These pleomorphic bacteria are difficult to cultivate. The main pathogenic mechanism is non-specific tissue damage caused by acid production. *Bacteroides* and *fusobacteria* produce enzymes, which facilitate their penetration into tissues.

These bacteria can cause infections anywhere in the human body: oral, pleuropulmonary, intra-abdominal, periodontal infections, infections in the small pelvis, and female genital infections. They are also infectious agents in tissues damaged by injury or surgery. Abscesses filled with foul-smelling pus are formed at the site of affliction. *Lincomycin*, *chloramphenicol*, *clindamycin* and *metronidazole* are used for therapy. Surgery (incision, drainage) is often necessary.

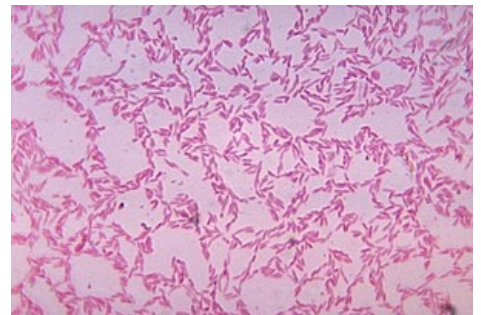
### **Bacteroides spp.**

The genus *Bacteroides* is part of the natural bacterial flora, some species are potentially pathogenic. Their membrane contains sphingolipids and there is diaminopimelic acid in their wall.

*Bacteroides* are gram-negative pleomorphic rods with round ends, usually **encapsulated**. They are characterized by **resistance to bile acids**. They massively colonize the large and small intestine, where they play a role in the digestion of complex molecules, and the upper respiratory tract. The microflora of the vagina contains ***B. fragilis***, ***B. capillosus*** or ***B. ureolyticus***. Their endotoxin has a low biological activity.

#### **Pathogenicity**

Among the most important pathogens is ***B. fragilis*** with a polysaccharide capsule as a virulence factor. It can cause peritonitis, surgical site infection, gastrointestinal infections and appendicitis. It also inhibits phagocytosis and, like other species of this genus, it is **resistant** to beta-lactams, aminoglycosides, and erythromycin. Tetracycline-resistant species have recently emerged. The genus *Bacteroides* also includes e.g. *B. ovatus*, *B. vulgatus* and *B. gracilis*.



*Bacteroides* spp.

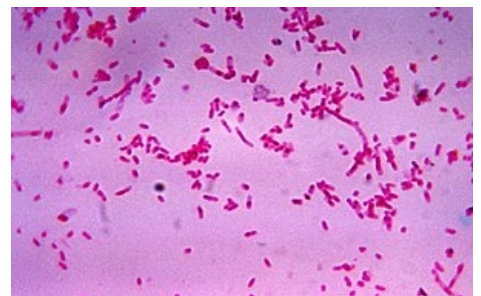
### **Prevotella spp.**

Bacteria of the *Prevotella* genus are gram-negative anaerobic fermenting rods related to the *Bacteroides* genus. Individual species include ***P. oris***, ***P. buccae***, ***P. dentalis***, and ***P. melaninogenica***. Diseases caused by these bacteria include infections of the wound, urinary tract, and respiratory tract (angina, sinusitis); they can also be infectious agents in the formation of abscesses in the oral cavity, for example after a human bite. The production of beta-lactamase makes them resistant to beta-lactam antibiotics.

### **Fusobacterium spp.**

The genus *Fusobacterium* includes gram-negative anaerobic rods, which are part of the natural bacterial flora of the upper respiratory, digestive and genital tracts. Pathogenic species include ***F. necrophorum*** and ***F. nucleatum***. *Fusobacterium* causes surgical and traumatic wound infections and complicates animal bites. It can be identified in mixed cultured causing pneumonia, thoracic empyema, intra-abdominal infection and abscesses. Rarely, *fusobacterium* can cause osteomyelitis.

***F. nucleatum*** is part of dental plaque, invasiveness is enabled by the ability to adhere to both G<sup>-</sup> and G<sup>+</sup> biofilm. Bacteria can also cause inflammation of the periodontium. ***F. necrophorum*** causes serious infections of children and adolescents, a severe condition is **necrotizing tonsillitis** accompanied by the formation of abscesses.



*Fusobacterium novum*

### **Mobiluncus spp.**

Bacteria of the *Mobiluncus* genus are gram labile anaerobic moving rods. They are isolated from the mucosa of the female reproductive system with **bacterial vaginosis**, often together with *Gardenerella vaginalis* and other bacteria. They are also found in women without clinical symptoms. This genus contains *M. curtisii* and *M. mulieris*

## Gram-negative anaerobic cocci

The genus G— anaerobic cocci includes *Acidaminococcus spp.*, *Megasphaera spp.*, which are part of the natural bacterial flora. Bacteria of the genus *Veillonella* are the most important clinically.

### Veillonella spp.

Bacteria of the *Veillonella* genus are gram-negative anaerobic cocci, which usually form clusters or pairs. Under UV light, they are red fluorescent. They are part of the natural bacterial flora of the oral cavity, nasopharynx, digestive tract and female genitalia. They can cause **mixed infections**, exceptionally they have been identified as agents of meningitis, osteomyelitis and periodontal infections. The genus includes *V. parvula*, *V. montpellierensis* or *V. alcalescens*. *V. parvula* may be the cause of endocarditis.

## Links

### External links

- Bacteroides

### References

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