

# Anaerobes

**Microscopy+cultivation:** pleomorphism, VL  
agar/broth, growth 3-5 days

**Biochemical signs:** various activity, smell

**Dg.:** microscopy, cultivation, biochemistry

**Pathogenity:** component of common  
nasopharyngeal flora, vagina etc. Conditional  
pathogenic, originate absceses, inflammation of  
abdominal cavity, little pelvic, endogenous origin

**Therapy:** incision, drenage, linkomycin,  
klindamycin, metronidazol

# Anaerobes

## G-cocci

- *Veillonella parvula*
- raises mixed endogenous infection

## G+cocci

- *Peptococcus niger*  
has dark colonies
- *Peptostreptococcus*  
split peptides

# G-rods

*Bacteroides fragilis* - grey colonies, is resistant to penicillin, kanamycin, susceptible to rifampicin

*Porphyromonas gingivalis* – brown/black pigment with fluorescence in UV rays, resistant to kanamycin, susceptible to PNC, rifampicin, raises inflammation of oral cavity

*Prevotella melanogenica* - black pigment, originates tonsillitis, usual cultivation is negative

# G-rods

*Fusobacterium nucleatum, necrophorum* – looks like fibre, originates pneumonia, liver absces

**Fusospirochetosis** - originates gangrenous disintegration of a tissue

*Mobiluncus sp.* - movable, originates bacterial female vaginosis, difficult cultivation, usually we don't practise

# G+rods forming spores

- *C. botulinum*
- *C. tetani*
- *C. difficile*
- *C. perfringens, novyi, septicum* etc.

# *C. botulinum*

**Microscopy+cultivation:** G<sup>+</sup> rods, colonies with irregular borders (blood agar) and  $\beta$ -hemolysis

**Factors of virulence:** Component of intestine, produce toxin (food contamination). Botulotoxin A-G (A and B preserve vegetables, E preserve meat) – has influence on neuromuscle disc, causes inhibition of acetylcholin release - muscle paralysis

**Pathogenity:** 3 types of a botulinism - alimentary, wound (spors are taken into the wound), suckling (toxin is produced direct in intestine).

Manifestation of poisoning: vomiting, weakness, double sight, mydriasis, ileus, muscle paralysis including respiratory muscle

Botulotoxin is used also in plastic surgery, bioterrorism

**Dg.:** neutralisation mouse demonstration, toxin detection (chromatography) in blood, vomiting, food remainders

**Therapy+ prevention:** antitoxic serum, regular preservation

# *C. tetani*



**Microscopy+cultivation:** G+rods, terminal spores, weak coated and weak hemolysis

**Pathogenity+pathogenesis:** in digestive tract of mammalia, spors are taken into the wound (for ex. fork), germinate and produce toxins (tetanolysin and **tetanospasmin** - inhibition of release of inhibitory mediators). Clinical signs: convulsion (mim. muscles-risus sardonius, bow bended body-opistotonus, trismus-impossibility to open the mouth), muscle ruptures, fractures

**Dg.:** microscopy, cultivation, demonstration on mouse

**Therapy+prevention:** antitetanic globulin, myorelaxantia, vaccination

# Tetanus





# *C. difficile*

**Mikroskopy+cultivation:** G+rods, subterminal spores, on selective soil form colonies with rough surface, big 3-5 mm, without hemolysis

**Pathogenity+patogenesis:** long-term using of antibiotics like klindamycin, cefalosporins lead to inhibition of common flore, discover of ulceration covered with pablanes, diarrhoea, temperature – “pseudomembraneous colitis”

**Factors of a virulence:** A and B toxins, only both together cause the disease

**Dg.:** cultivation on selective media, toxin detection via ELISA method

**Therapy:** vankomycin, metronidazol

# Clostridia of anaerobic traumata

*C. perfringens, novyi, septicum, histolyticum* etc.

**Pathogenity:** wound infection, fasciitis, gangrenes  
accompanied with pain in wound, swelling, bubble  
crepitation in tissue

**Dg.:** microscopy, cultivation

**Therapy:** PNC, linkosamids, hyperbaric chamber,  
anti-shock therapy, surgical therapy,  
antigangrenous serum

# *C. perfringens*

**Factors of virulence:** toxic enzymes –  $\alpha$ -toxin (phospholipase, lecithinase), enterotoxin,  $\beta$ -toxin etc.

**Dg.:** microscopy, cultivation, detection of  $\alpha$ -toxin (lecithinase) - coagulation of egg lecithin, specificity of lecithinase we demonstrate with inhibition of precipitation

# Anaerobox



# Anaerostat

Citric acid +  $\text{NaHCO}_3$  +  $\text{O}_2$  +  $\text{N}_2$

Pd catalysator



$\text{CO}_2$  +  $\text{H}_2\text{O}$  +  $\text{H}_2$  +  $\text{N}_2$

**Anaerobic atmosphere**

