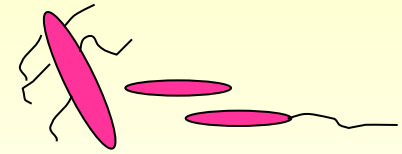


Enterobacteria



G-rods, facultative anaerobe, O (body), H (flagellate), K (fimbrial) antigens, many are comensals in intestine but some are potential pathogens

Factors of virulence: Endotoxin, fimbrias, exotoxins

Lab. detection: cultivation on **BA/Endo**, chromogennous media, biochemistry (enterotest), antigennous analysis, in addition to intestinal infections we also do ATB susceptibility testing

Transport: often fecal-oral

Therapy: cefalosporins, fluoroquinolons, aminopenicillins, carbapenems etc.

Yersinia

Y. pestis

immobile

Causes 3 forms of pest:

1. bubonic pest (hit only regional lymphatic nodes)

Transducer: flea *Xenopsilla cheopis*,

2. pulmonary form - aspiration of the dust by ill-nursing

3. septic form



Y. enterocolitica

apendicitis-like syndrome, growth on **CIN medium in cold, urease+**

Salmonella sp.

Salmonella typhi

septic fever and headache, pink spots on the skin, alive in gallbladder

Detection: direct – from blood and urine, agglutination, indirect – Widal reaction proof of antibodies

Therapy: fluoroquinolons, chloramphenicol, cholecystectomy in vectors is used

Primary zoonopathogenous salmonellas (*S. enteritidis* etc...)



Biochemistry: production of H₂S (hydrogen sulfide), disunite mannitol

Cultivation and detection: lactosis negative colonies on ENDO, on XLD/MAL/DC - black colonies, agglutination, multiply in selenite broth

Pathogenicity: diarrhea

Source: domestic birds, eggs, salad cream, ice...

Therapy: ATB are not indicated, we use sauerkraut, yogurt, keep hygiene rules

Genus *Shigella* (*Sh. flexneri, sonnei, boydii, dysenteriae*)

immobile, causes watery diarrhea with tenesm, blood in stool
Epidemics from water sources – camps, social care institutions

Therapy: fluids

Escherichia coli

Saprophyte in intestine, pathogenic ones are only these, with specific factors of virulence, these are divided into groups:

EPEC (enteropathogenic) - diarrhea in children < 2 let, serotypes like O55, O126 // known as Pharaoh revenge

ETEC (enterotoxigenous) – cause travel diarrhea

EIEC (enteroinvasive) – bloody diarrhea

VTEC/EHEC (verotoxigenous, enterohemorrhagic) – intestinal bleeding, hemolytic-uremic syndrome. Most common serotype O157

Out of intestine can cause urinary tract infections, wound infections etc.

Diagnostic: growth on **ENDO** -typical metal shine, **lactose positive**, form **indol**, **pyr** test negative, agglutination is needed in special cases

Therapy: susceptible to many antibiotics including ampicillin

Genus *Enterobacter*

Mobile

resistance to ampi,
cefalosporins I. and II. gen.

Urease -

Genus *Klebsiella*

immobile

res. only to ampicillin

urease +

Pathogenicity: similar: urinary infections, pulmonary infections, sepsis, ability to form extended spectrum β -lactamase (ESBL), therapy: carbapenems only

Serratia marcescens

Nosocomial infections, heteroresistance to colistin

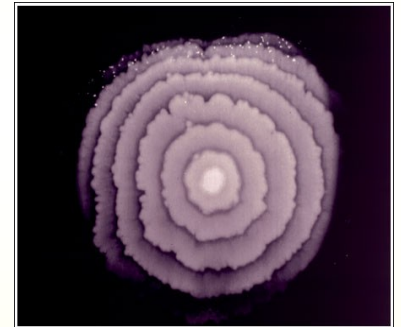
Genus Proteus

Cultivation: crawl in waves on medium - Rouss phenomenon

Biochemistry active, smell, **urease +**, in addition to *P. mirabilis* form indol

Pathogenicity: wound/urinary infections

Therapy: primary resistance to nitrofurantoin and colistin



Genus Citrobacter

looks like salmonella, can form **black** colonies on **XLD**, **ONP+** and **PYR test+**

G- micro-aerophile rods

Campylobacter jejuni 

Microscopy: G-bent rods

Cultivation: spec. medium with carbon
Grey colonies with metal shine
cultivation via 42°C 48 hours

Biochemistry + resistance:

oxidase, catalase

Resistant to cefalotin

Susceptibility to nalidix acid

Pathogenicity: diarrhea

Therapy:

without therapy/hard infections - macrolides

Helicobacter pylori 

G-curved rods

2 media: Thayer-Martin medium + control medium
little transparent colonies like haemophilus
5 day cultivation

oxidase, catalase, urease

S to cefalotin

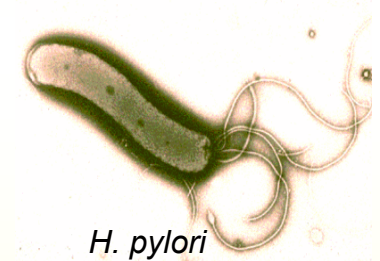
R to nalidix acid

gastritis to gastric ulcer

3kombin.

amoxic.+metronidazol+bismut

amoxicillin+claritromycin+omeprazol



Genus *Vibrio*

Live in water, better grow i presence of NaCl (halophilic) + grow also in alcalic pH, susceptible to vibriostatic compound, after drop of deochycolate sodium form string (string test), oxidase

V. cholerae



Microscopy: G- curved rods, with flagellum

Due to O antigen we distinguish 155 serotypes. Most common are O1 (El Tor and classic type), O139, non O1/O139 - NAG (nonagglutinable) vibria

Pathogenicity: diarrhea looking like rice soup, vomitting

Therapy: rehydratation + chloramphenicol

Diagnostic: cultivation on TCBS agar - green colonies, membrane in alcalic pepton water, detection of serotype with help of the agglutination

Other vibria

Cause diarrhea, wound infections

Aeromonas

negative string test

Not susceptible to vibriostatic compound

Cause diarrhea, on TCŽS form yellow colonies