

Bacteriology for Dummies

GRAM STAIN TELLS YOU EVERYTHING. Two dyes are applied:

Gram-positives have thick walls which retain the bluish crystal violet dye.

Gram negatives have thin walls which only retain the red carbol fuschin dye.

Gram-negatives:

= ALWAYS have endotoxin

= ALWAYS have Lipopolysaccharide (which enrages macrophages)

OBLIGATE AEROBE RODS:

Eg. *Pseudomonas aeruginosa*
Bordetella pertussis
Haemophilus Influenzae
Legionella pneumophila

All of these are
RESPIRATORY TRACT INFECTIONS!!
Seeing as they require oxygen to live

Also *Campylobacter Jejuni* (microaerophile gut resident)

OBLIGATE AEROBE COCCI:

Moraxella catarrhalis

Facultative ANAEROBE RODS: gut flora

Eg. *Escherichia Coli*
Shigella dysenteriae
Salmonella typhi
Proteus sp.
Klebsiella sp.
Bacteroides fragilis

Gut-dwellers, facultative anaerobes
(prefer to live without oxygen, but its
not toxic to them)

Facultative Anaerobe Cocci

Neisseria meningitidis
Neisseria gonorrhoei

Pyogenic Gram-negative cocci

Obligate ANAEROBE COCCI are mainly faecal and irrelevant

Eg. *Veillonella*

Gram-Positives don't really need the air...

Obligate AEROBE RODS

Bacillus Subtilis
Bacillus cereus,
Bacillus anthracis

Obligate AEROBE COCCI

Micrococcus (clinically irrelevant)

*most fungi are obligate aerobes and are gram-positive

Facultative ANAEROBE RODS: spore-formers

Listeria monocytogenes: non-spore-forming

FACULTATIVE ANAEROBE COCCI

Streptococcus viridans
Enterococcus sp.
Staphylococcus aureus
Streptococcus pneumoniae
Streptococcus pyogenes

MOST COMMON PATHOGENS!!
= Pyogenic cocci

OBLIGATE ANAEROBE RODS: spore-formers

Clostridium tetani
Clostridium botulinum
Clostridium Difficile

Compost-making soil bacteria;
natural decomposers. They cause
garbage to reek.

OBLIGATE ANAEROBE COCCI

Peptostreptococcus sp.
Streptococcus intermedius

Barely relevant; usually a co-
infection with some other
organism in a gut or liver

Rules of thumb:

- Anaerobes will only live on devitalised or hypoxic tissue.
- Anaerobe discharge is foul-smelling
- Gram negatives are generally immune to beta-lactams (except aminopenicillins)
- Anaerobes are generally immune to aminoglycosides