INTRO TO BACTERIA

18 Feb 00, 21 Feb 00, 18 Feb 02, 20 Feb 04, 21 Feb 05, 22 Feb 08, 25Feb09, 22Feb10, 18Feb11
Campbell's 6th: pp526-543, 7th: 534-546, Sadava: 72, 571-, 579,565, Campbell 9th: 556-573

Theory of disease: Punishment of God, misalignment of stars (disaster), miasma

Fracastorius (1546) **contagion:** disease infection can be caused by minute bodies capable of self-replication, transmitted from infector to infected. Said to have named syphilis.

Leeuwenhoek (1670s) first to see bacteria, but did not realize importance

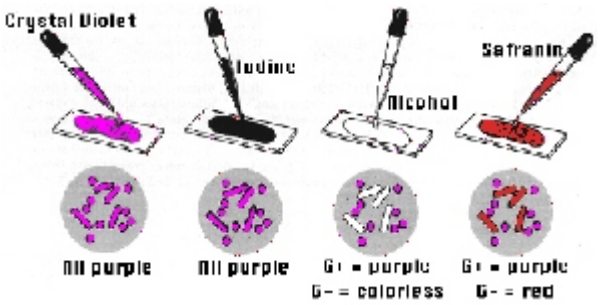
Ignaz Semmelweis (1848) In charge of lying-in hospital. Wing with midwives had lower death rate than that with medical faculty: hands contaminated during autopsy. **iatrogenic** disease. Showed **puerperal fever** could be prevented by sterilizing physicians hands with chloride of lime (calcium hypochlorite).

John Snow (1854) contaminated Broad Street Pump caused cholera epidemic in London.

Joseph Lister (1860s) Introduced use of phenol as **antiseptic** during surgery in surgical dressings and sprayed into the air.

Pasteur (1865) Demonstrated that spoilage of wine was due to abnormal microorganisms. Noted **spoiled wine had rods as well as yeast**: "diseased wine." Keep air out during fermentation, restricts *Acetobacter*. Recommended heating to 63°C for 30 minutes when bottling (Pasteurization)

Robert Koch (1876) rival of Pasteur, identified **cause of anthrax** disease of sheep and cattle.



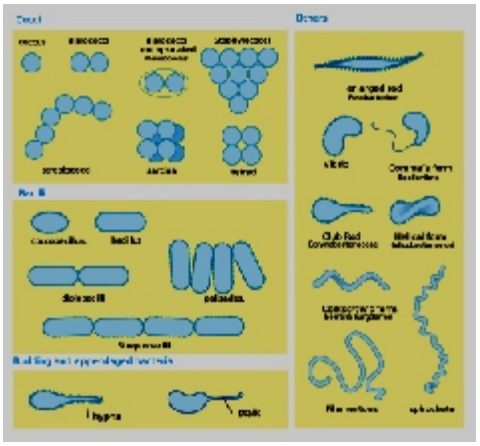
Koch's Postulates: (p)

1) **All diseased animals** must display **putative pathogen** (PP)
2) Isolate PP in **pure culture**
3) Inject health animal with PP **pure culture, cause disease**
4) **Reisolate PP** from experimentally diseased animal

Christian Gram (1884)

Dutch, developed **differential stain**:

1)	Stain with crystal violet	primary stain
2)	Flood with iodine	mordant
3)	Wash with EtOH	decolorize
4)	stain with safrannin O	counterstain



Gram pos vs Gram neg cell walls: (p. 557)

Gm+: thick layer of peptidoglycan, contracts tightly with EtOH, forms barrier

Gm-: thin peptidoglycan, but second outer membrane, dissolves in EtOH.

Groups , 571, 572

Morphology	**Gram Positive (More sensitive)**	**Gram negative (More resistant)**
Bacilli	*Clostridium* *Bacillus* *Lactobacillus*	*Escherichia coli* *Salmonella* *Yersina pestis* *Vibrio cholerae*
cocci	*Staphylococcus* *Streptococcus* *Diplococcus*	*Neisseria*