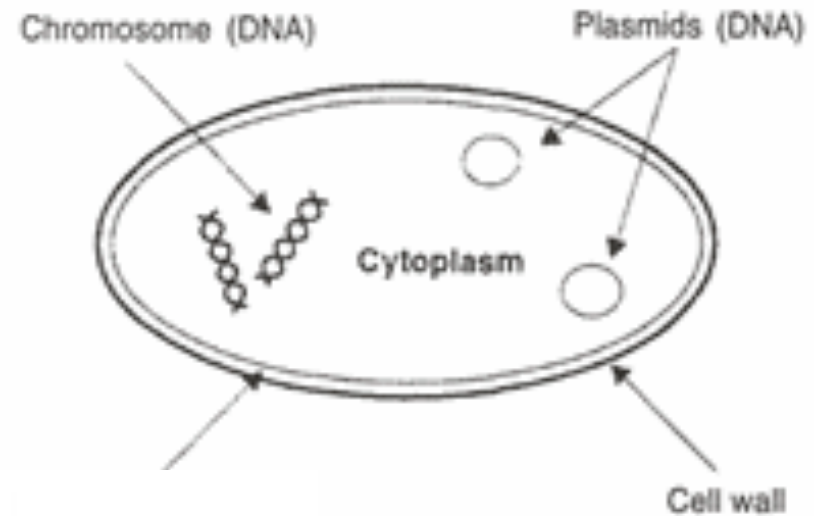
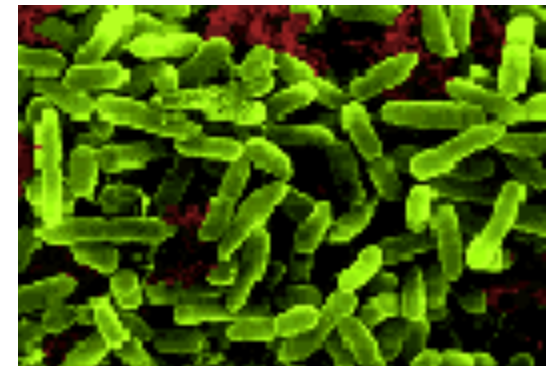
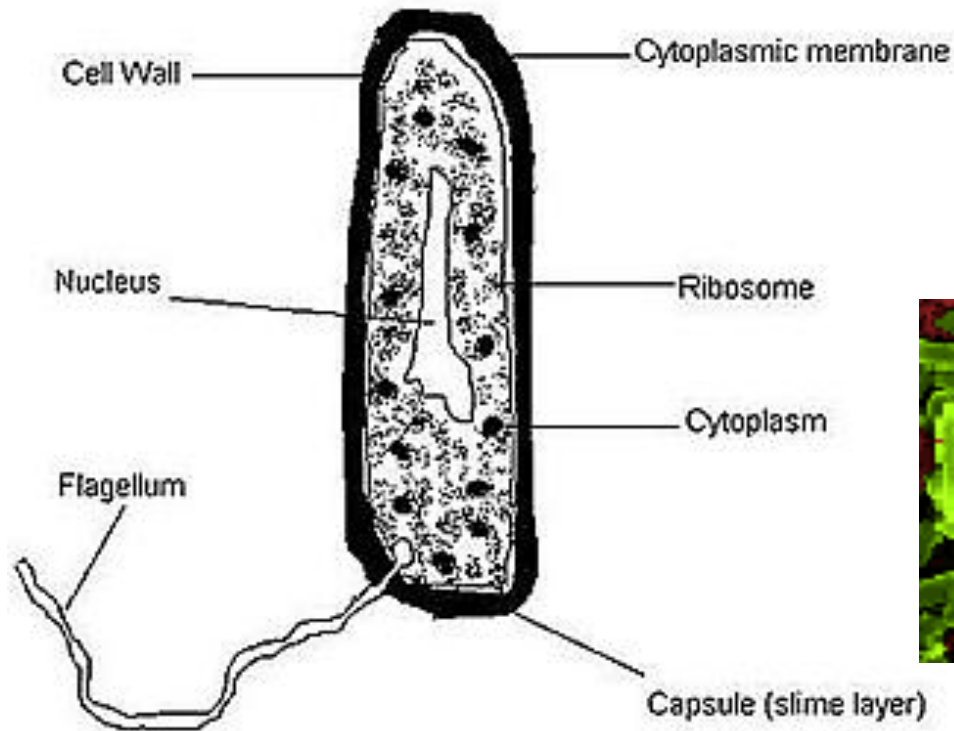


Bacteria Cell



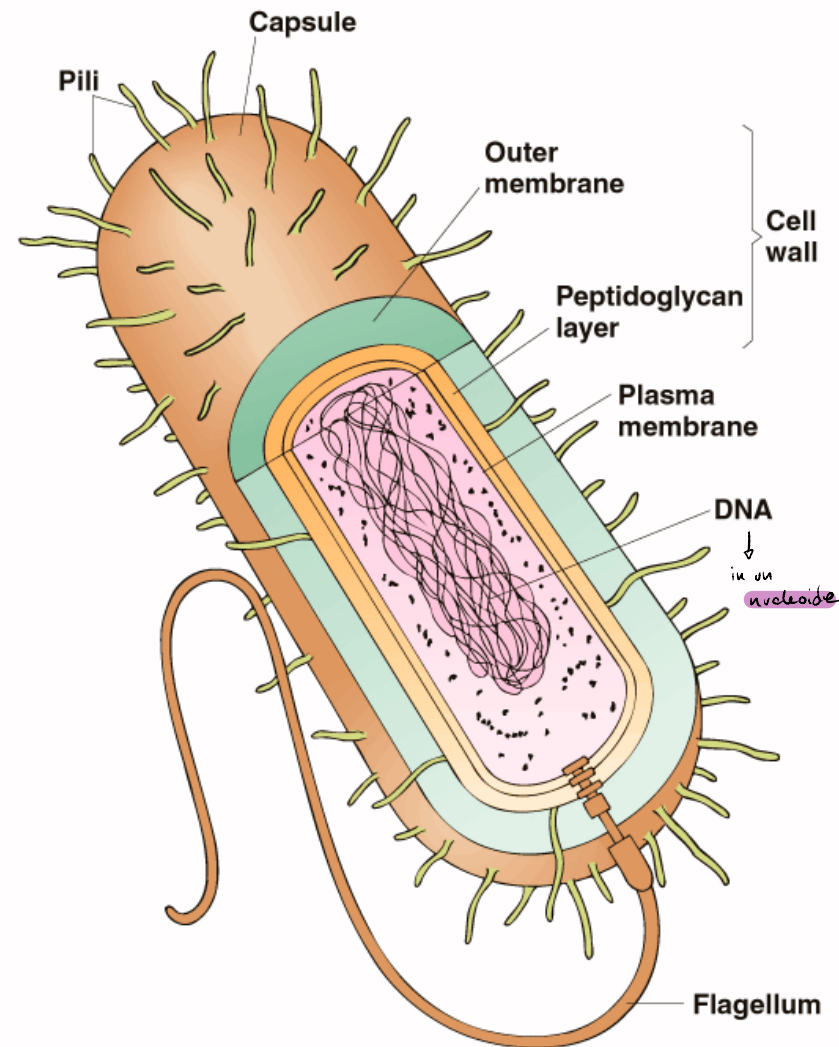
Typical Bacterial Cell



Prokaryotes

- Cells that do not have a nucleus
- Exist almost everywhere on earth
- Grow in numbers so great you can see them with the unaided eye
- Are placed in either the Eubacteria or the Archebacteria Kingdoms

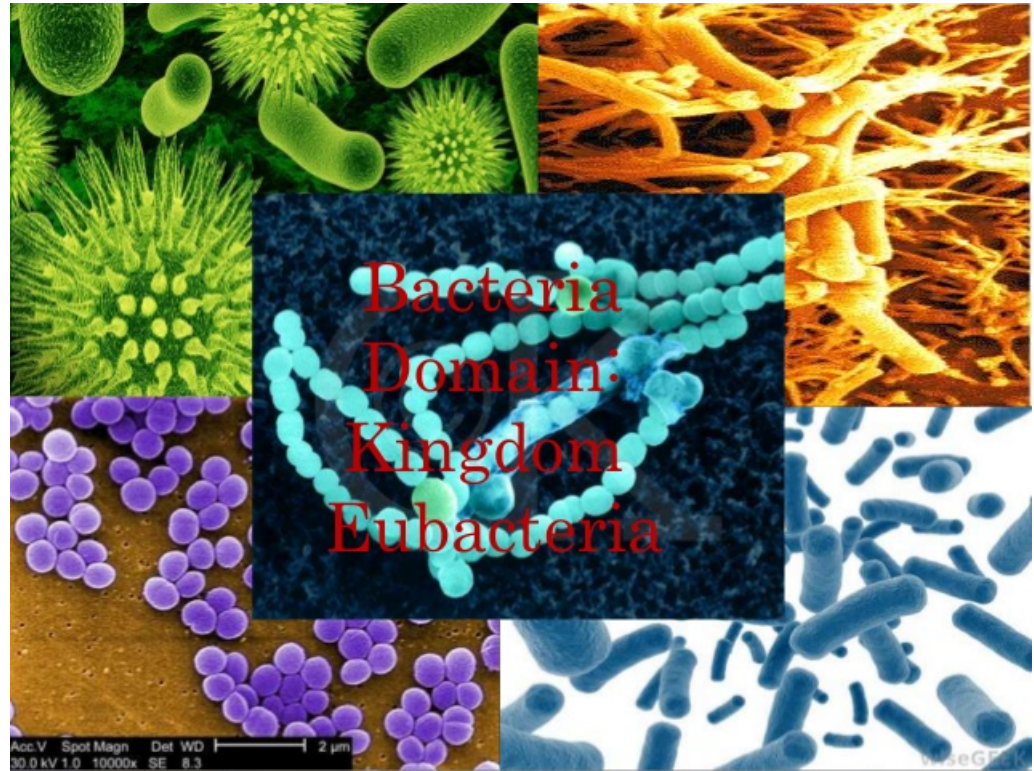
Solomon: Biology, 5/e
Figure 23.9



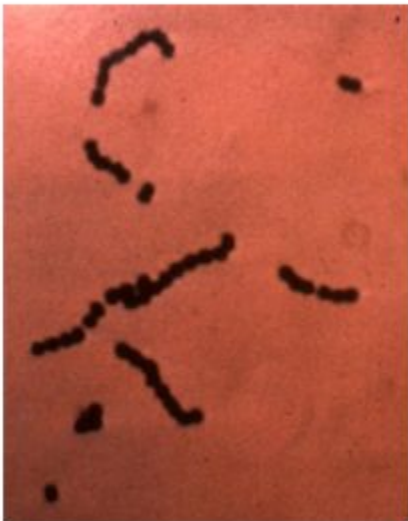
Eubacteria

- Make up the larger of the two prokaryote kingdoms
- Generally are surrounded by a ^{circumst}cell _{parite cellule} wall composed of complex carbohydrates

N-acetyl glucosamine



Examples of Eubacteria



streptococcus
(causes strep throat)



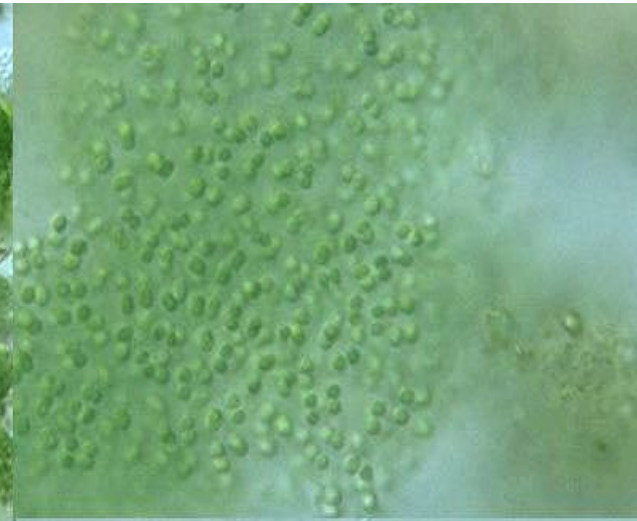
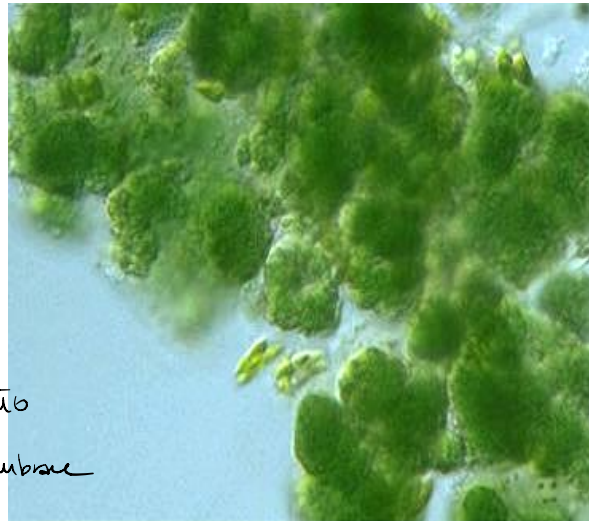
E. coli on lettuce
(helps digest food, can
cause food poisoning)



Lactobacillus bulgarus
(1st type of bacteria in
yogurt)

Cyanobacteria → alghe azzurre

- Photosynthetic bacterium
- Bluish-greenish color
- Contain membranes that carry out the process of photosynthesis
- Do not contain the same type of chloroplasts as plants do → tasche note per invaginamento delle loro membrane → altro tipo di clorofille
- This bluish-greenish algae can be found nearly everywhere on earth.
- Can survive in extremely hot environments and even extremely cold environment

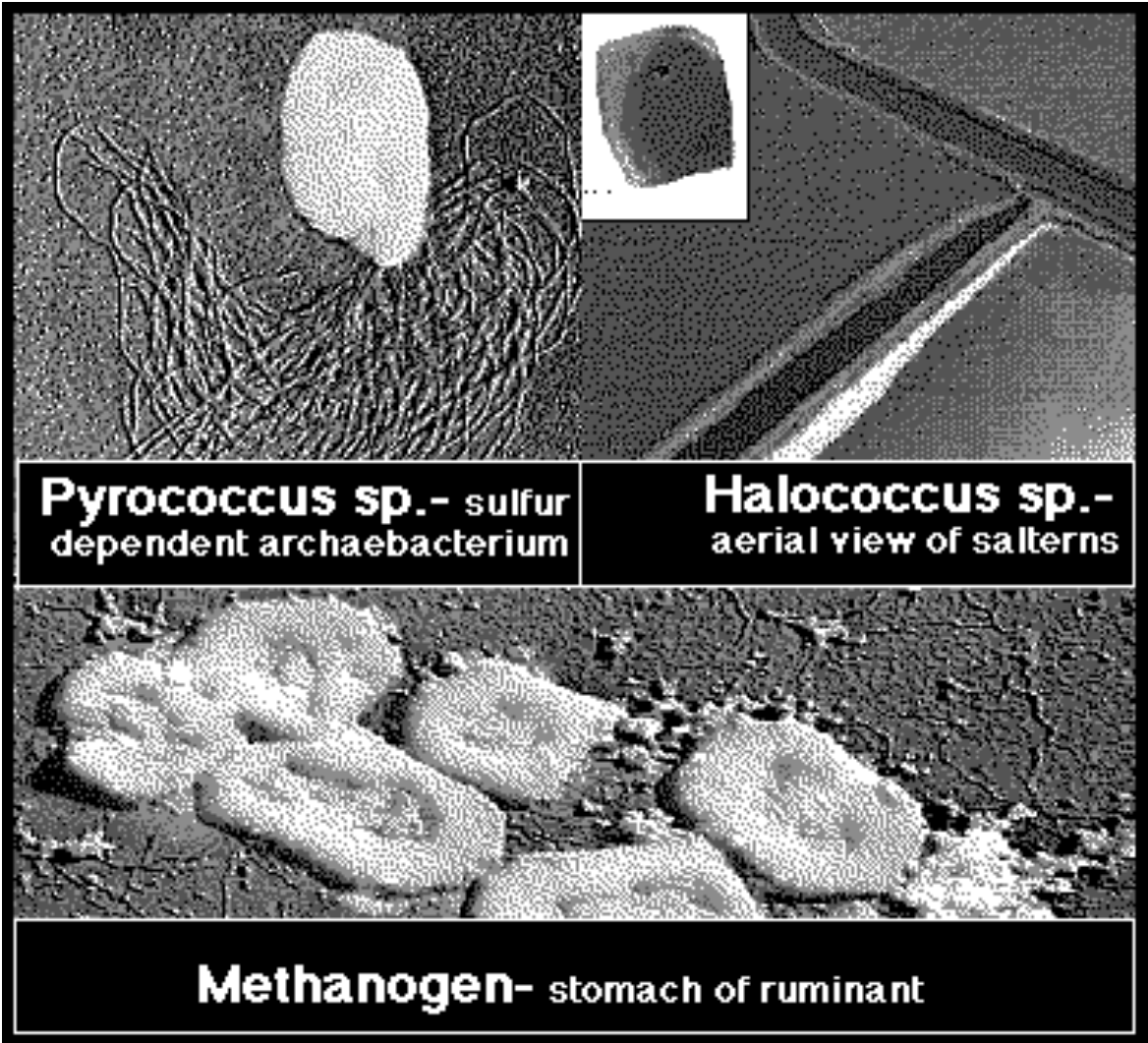


Prime forme cellulari evolute; organismi per lo più anaerobi, adatti per ambienti caldi ed inospitali. Sono ancora presenti nei fondali oceanici e nelle zone delle dorsali oceaniche in cui ci sono delle importanti emissioni di zolfo e gas. Da loro derivano eubacteria e eucarioti

Più una forma è meno evoluta, più evolve velocemente. Ecco perché noi deriviamo dagli archeobatteri

Archaeobacteria

- Lack important carbohydrate found in cell walls
- Have different lipids in their cell membrane
- Different types of ribosomes
- Very different gene sequences
- Archaeobacteria can live in extremely harsh environments
- They do not require oxygen and can live in extremely salty environments as well as extremely hot environments.



Identifying Prokaryotes

- Cell Shape
- Cell Wall
- Movement

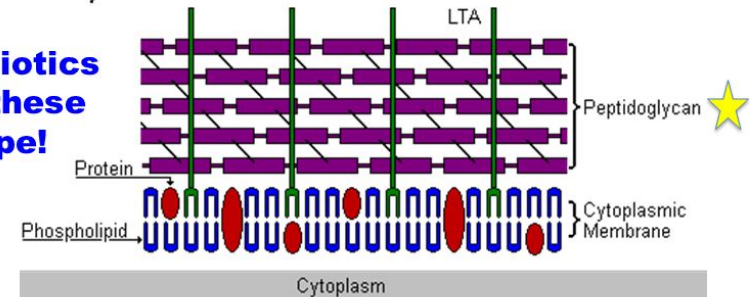
→ classification



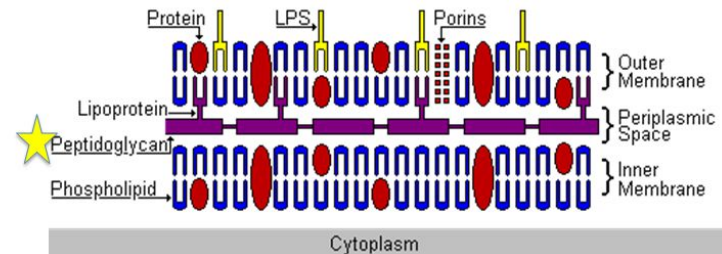
Eubacteria Cell Wall

Gram-positive Cell Wall

**Antibiotics
kill these
type!**



Gram-negative Cell Wall



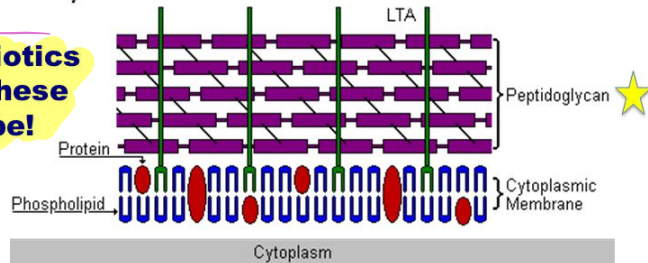
Cellular Walls

- Chemical nature of a cell wall can be determined by Gram Staining *→ colorazione di Gram*
- By finding out what color the cell produces when it is gram stained you can figure out the type of carbohydrates in the cell wall

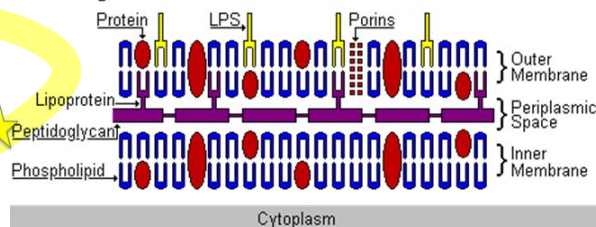
Eubacteria Cell Wall

Gram-positive Cell Wall

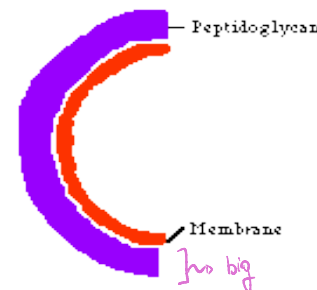
**Antibiotics
kill these
type!**



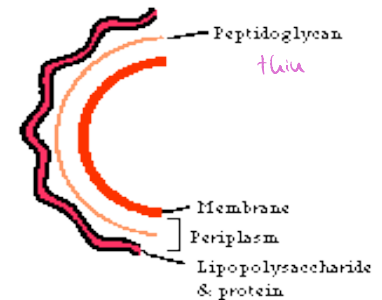
Gram-negative Cell Wall



GRAM +



GRAM -

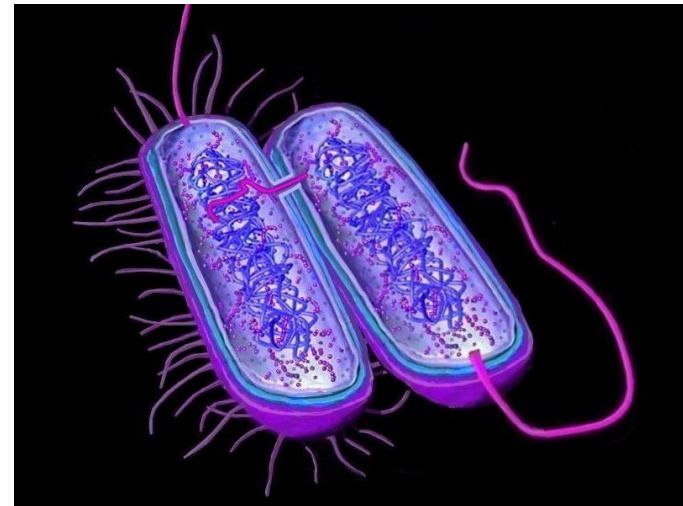


La struttura della parete cellulare ci permette di fare una suddivisione in due grandi gruppi: la colorazione di gram comprende una serie di passaggi. Viene usato un colorante viola e poi diversi lavaggi.

Lo strato spesso di peptidoglicani trattengono il colore, mentre quello sottile non lo trattengono (appaiono rosa)

Movement

- Flagella ~ Tail like structure the whips around to propel the bacterium 1
- Cilia ~ Miniature flagella surround the cell that help to “swim”
sono su tutta la superficie
numerose
- Non motile ~ Sticky cilia like structures that keep the bacterium from moving



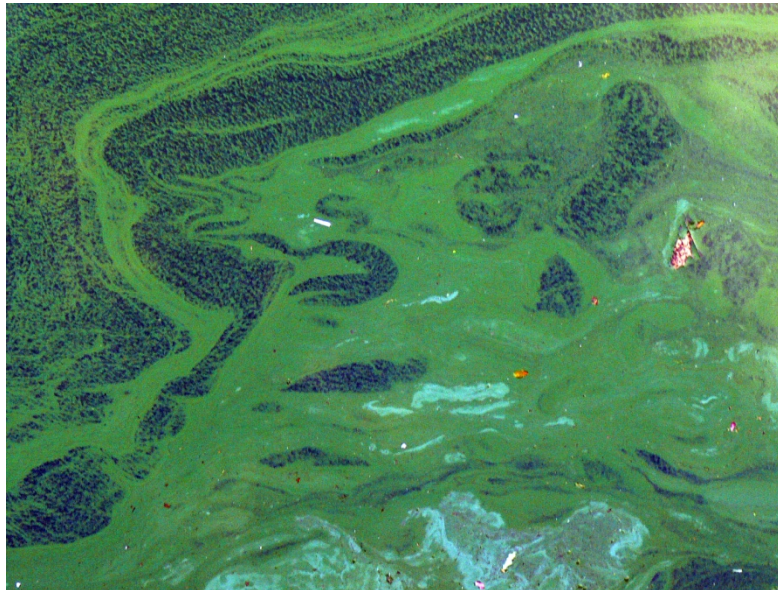
Bacteria and their energy

- Autotrophs
- Chemotrophs
- Heterotrophs



Autotrophs

- Make their own energy
Using Solar energy
- Es. Cyanobacteria



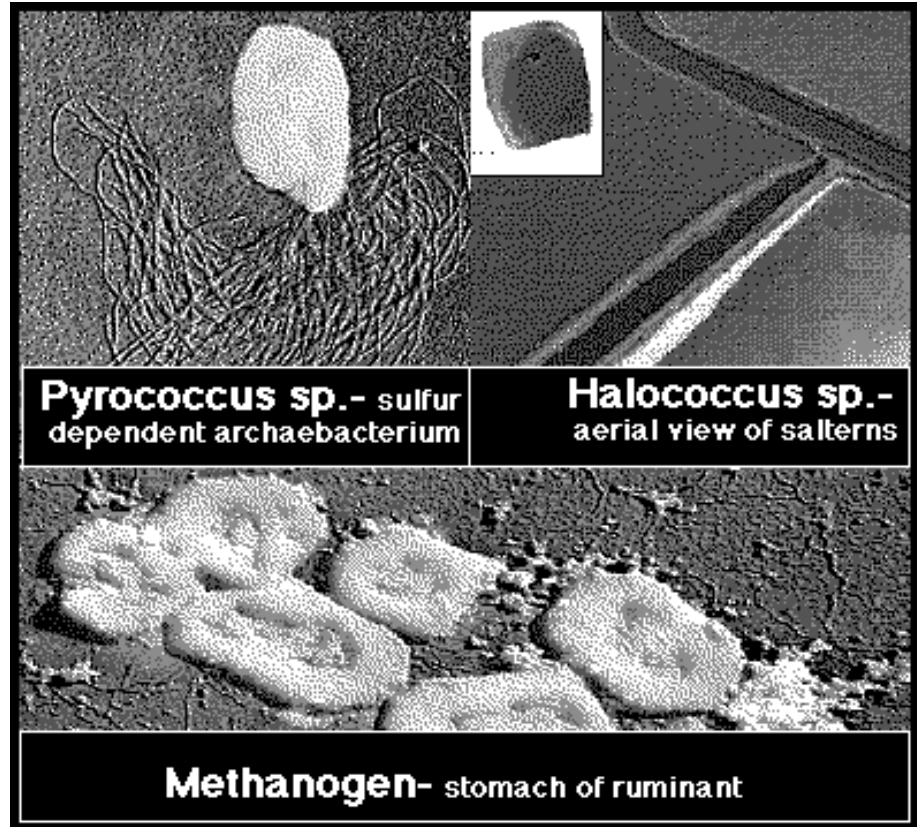
Chemotrophs

Chemiotrofi

→ solo nei batteri, in nessun altro regno

- Make own Energy
Using Chemical
energy → ossidoriduzione
- Es. Archaeobacteria

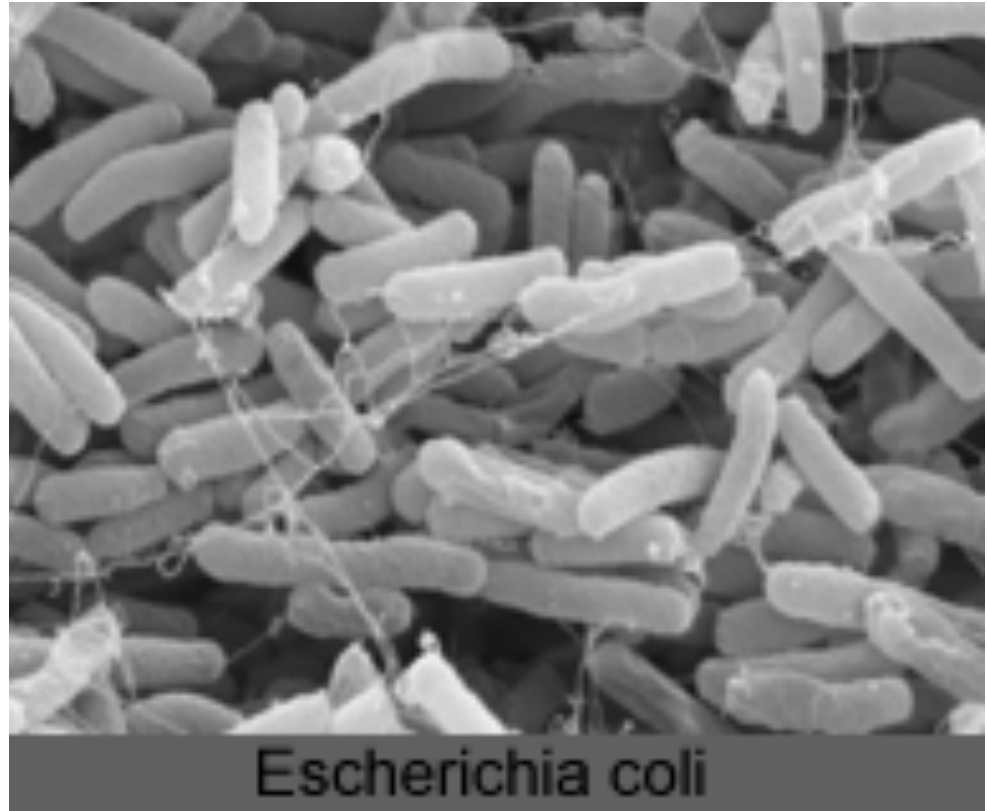
↓
tutti i chemiotrofi sono
ARCHEOBATTERI



Heterotrophs

- Obtain food by eating
- Es. E-coli

Per ottenere energia compiono la **glicolisi** ed eventualmente la **fermentazione**



Bacteria Respiration

- Obligate Anaerobes
 - Facultative Anaerobes
 - Obligate Aerobes
 - Live without Oxygen
 - Can live with or without oxygen
 - Cannot live without oxygen.
-
- ```
graph LR; OA[Obligate Anaerobes] --- P{ }; FA[Facultative Anaerobes] --- P; P --> LWO[Live without Oxygen]; FA --- G{ }; OA --- G; G --> CLO[Can live with or without oxygen]; OA --- R{ }; R --> CLWO[Cannot live without oxygen.];
```

# Bacteria Reproduction

→ complex system  
everyone can do asexual way of  
reproduction  
but also sexual

scissione binaria

asexual way of

but also sexual

- Binary Fission

- Conjugation

- Transduction

- Transformation

- Spore Formation

} → ambiente duro, i batteri formano delle spore (si rivestono di una sottile  
struttura proteica e si disidratano)  
↓  
germinano  
in un ambiente

