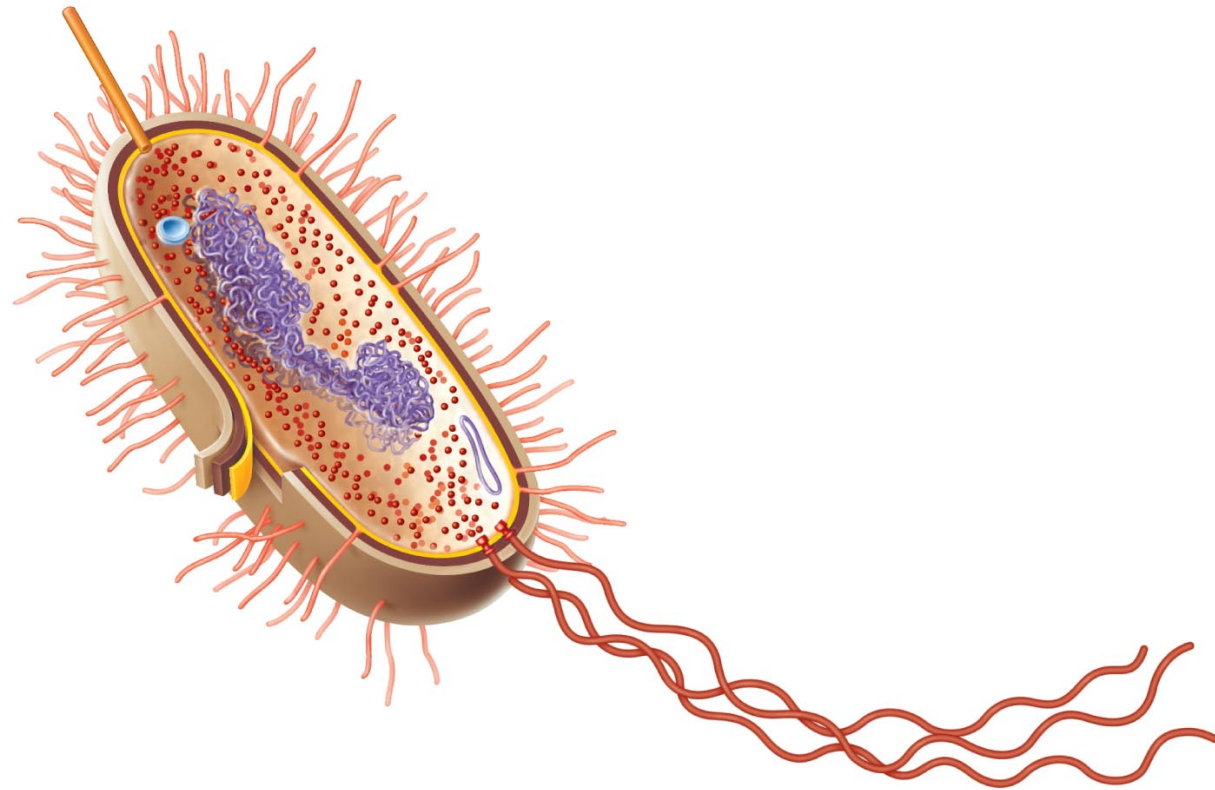
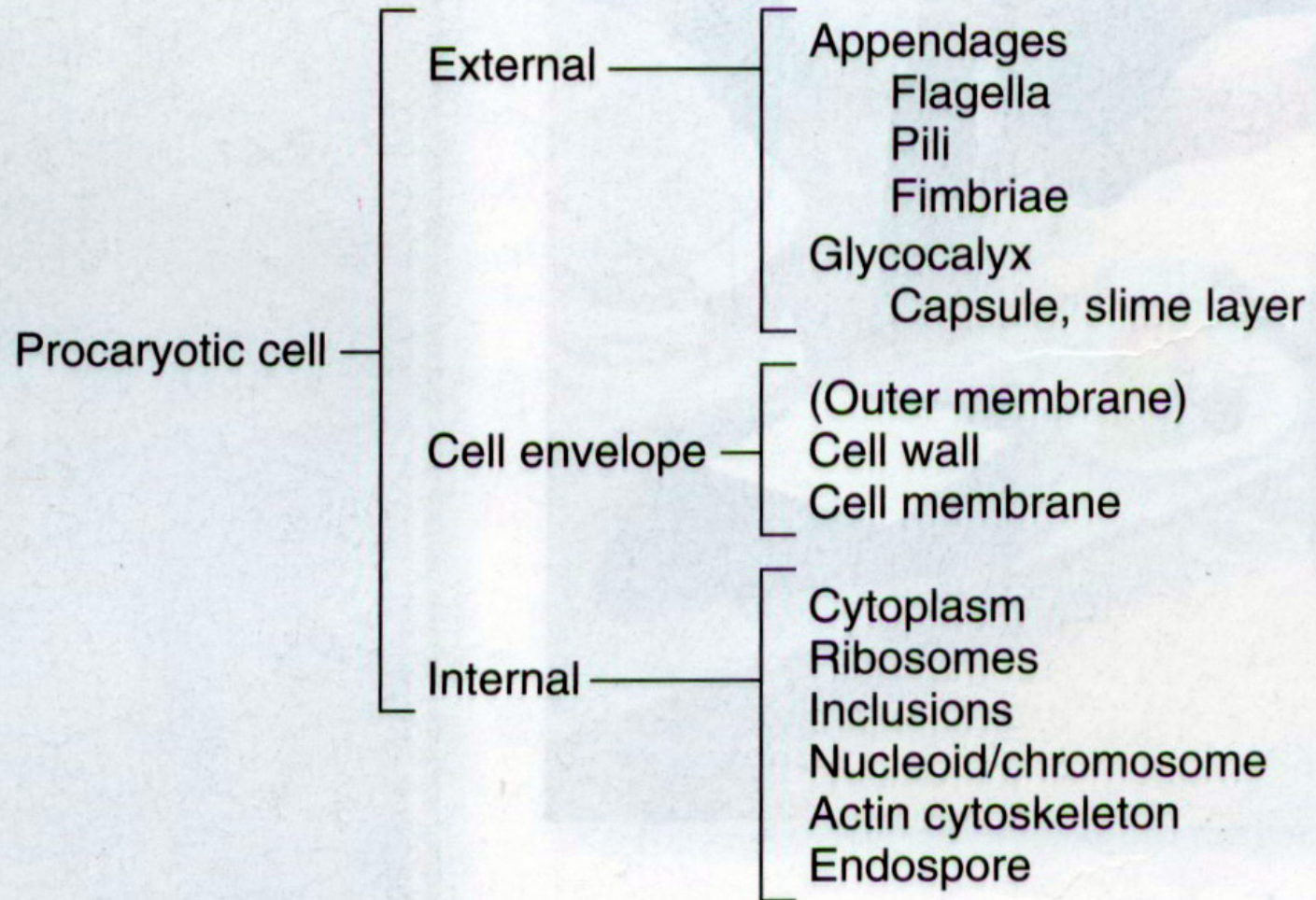


(sub A2) **Cell wall (CW)**

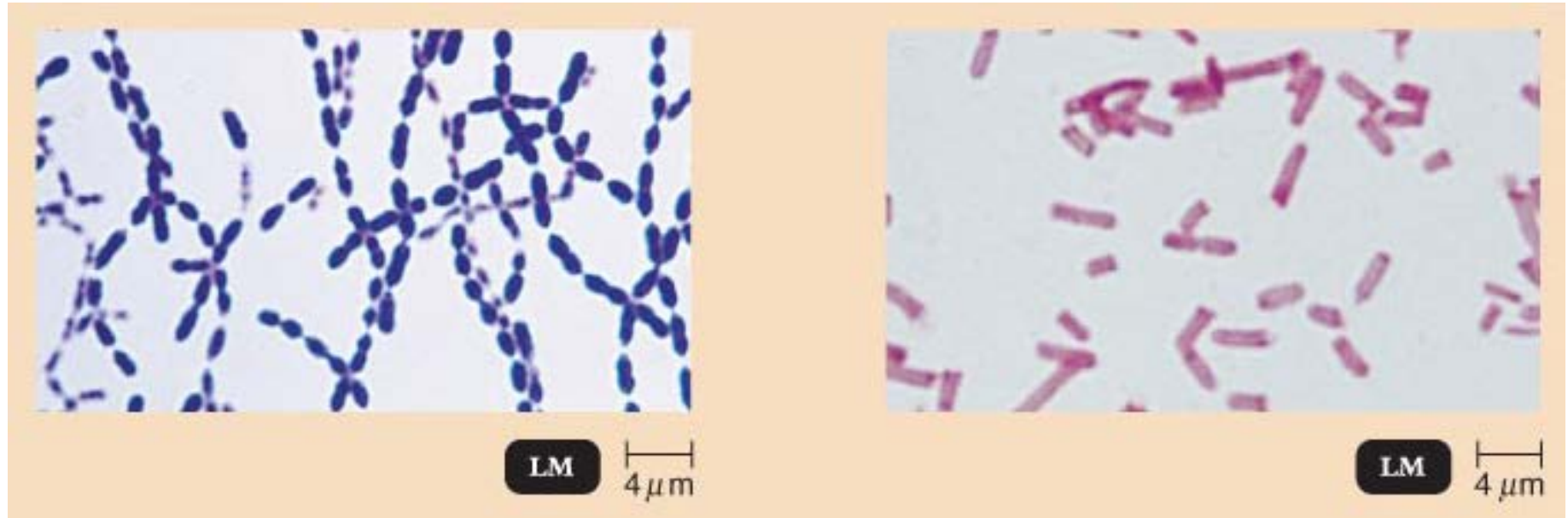
(intro to A2.2 and A2.3)

- **Purpose of the lecture:**
 - What are the general functions of the CW?
 - What is the Gram stain?
 - How do the structures of gram-positive and gram-negative cell walls differ?





The Gram Stain



(a) Gram-Positive

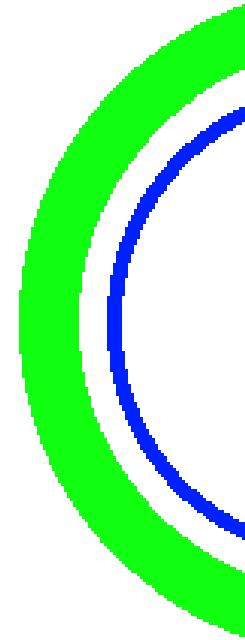
(b) Gram-Negative

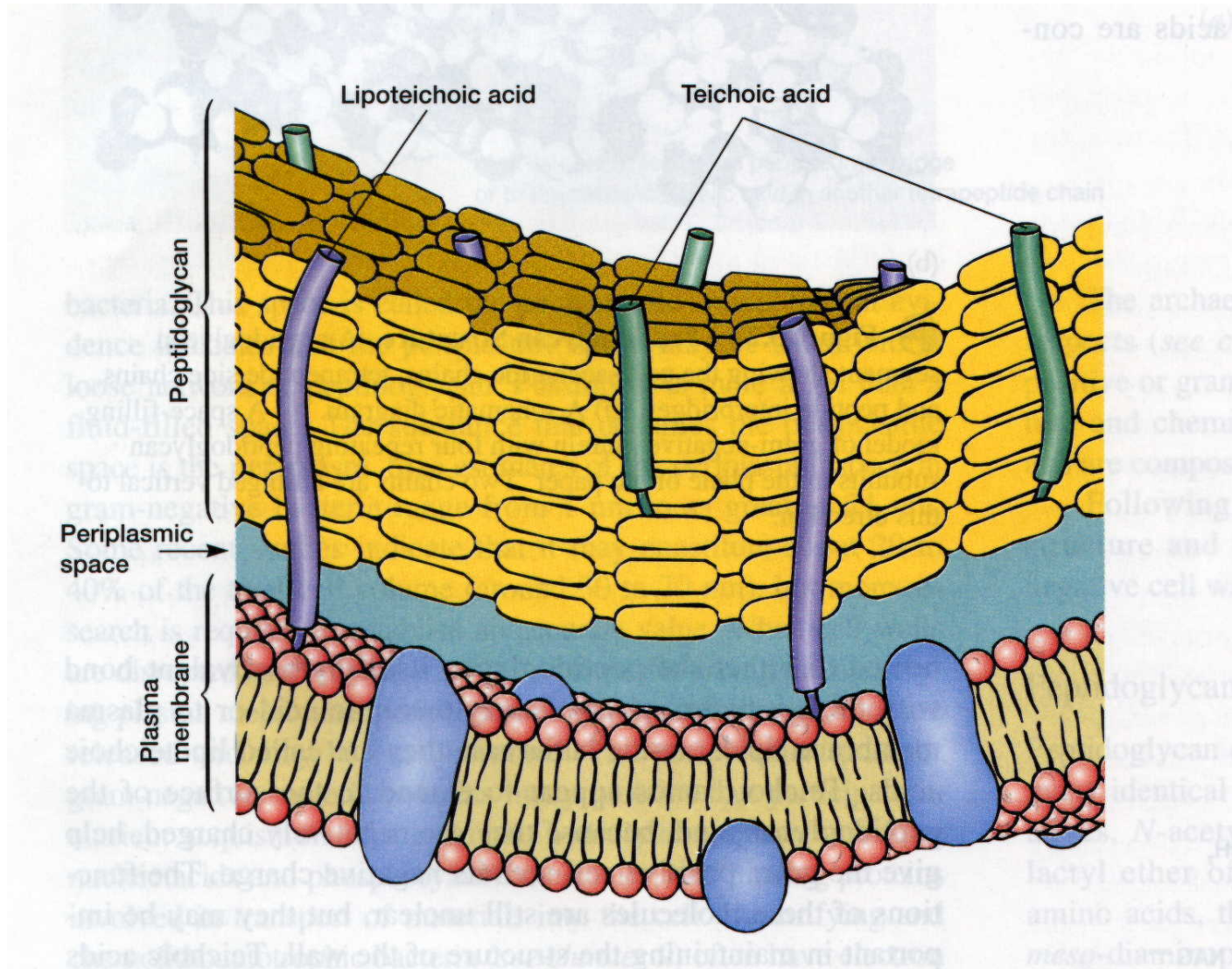
- Differential stain, most NB in microbiology

Staining is related to or reflects differences in?

A2.2 Gram-positive cell wall

- Thick homogeneous CW
- Primarily peptidoglycan (PG)
 -





Techoic acids

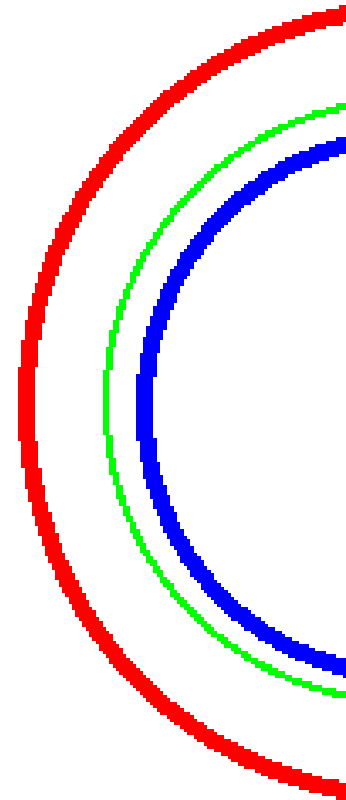
- CW contains large amounts
- Polymers
- Connected to?
 -
- Extend to surface
- What are lipotechoic acids?

Teichoic acid functions

- Maintain structure of cell wall
- Negative charge

A2.3 Gram-negative cell wall

- More complex
- Thin PG layer
 -
-



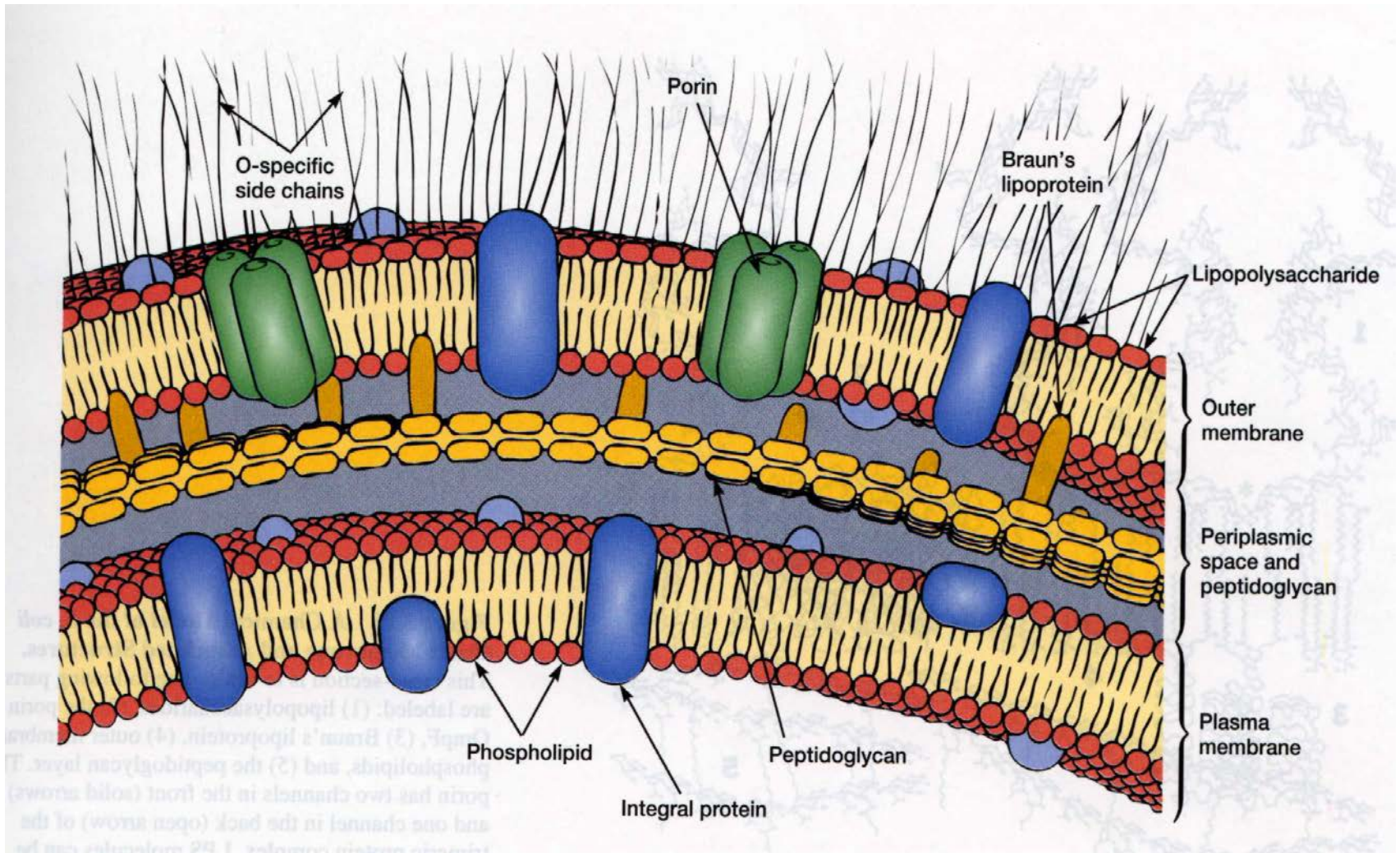
- **OM contains:**

-

-

-

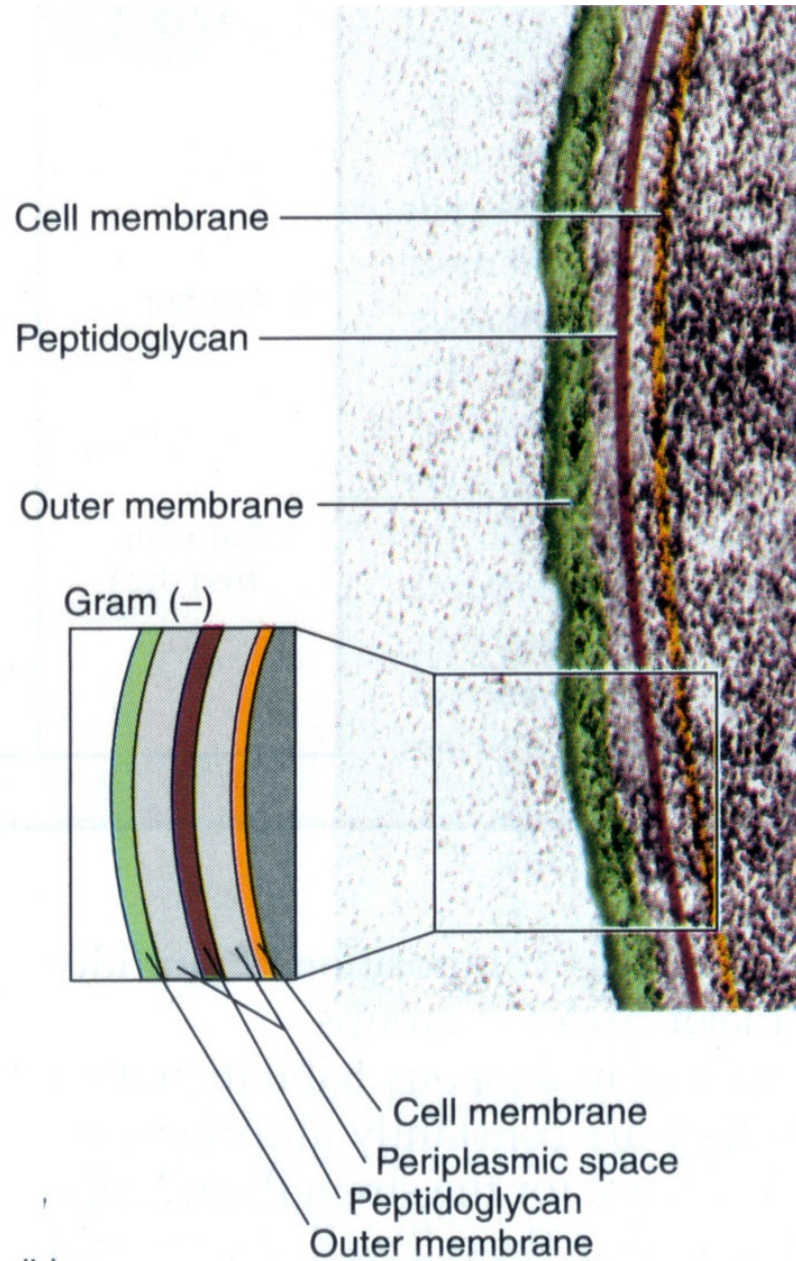
-



- **Braun's lipoprotein**

- What does it do?

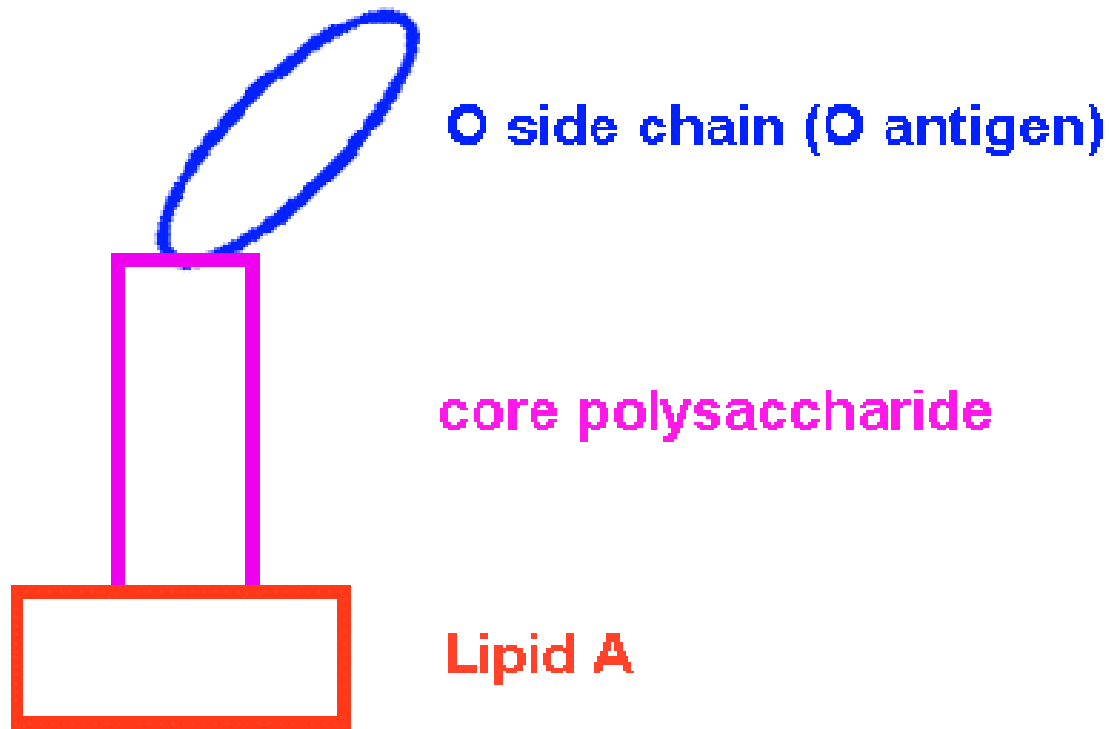
- How?



Lipopolysaccharides (LPS)

- Composition?
- OM is asymmetric
 -
 -
- e.g. *Salmonella typhimurium*

Structure



LPS functions

- *Lipid A* is major component of OM, helps stability
- Protect cells – permeability barrier
- *Core polysaccharide*
- O side chain
- LPS can acts as endotoxin

2.3.3.1 OM functions

- (component functions)
- Prevent loss of constituents
- Important protective barrier

- **Porins**

- Transmembrane proteins
- Channels for entrance/exit

2.3.2 Periplasmic space

- Occupied by periplasm
- **Many proteins that participate in nutrient acquisition**
- ET and Energy
- Chemoreceptors (chemotaxis)

- Enzymes for PG synthesis (also Gram+)
- Modification?
- Gram+?
 - Have what instead?