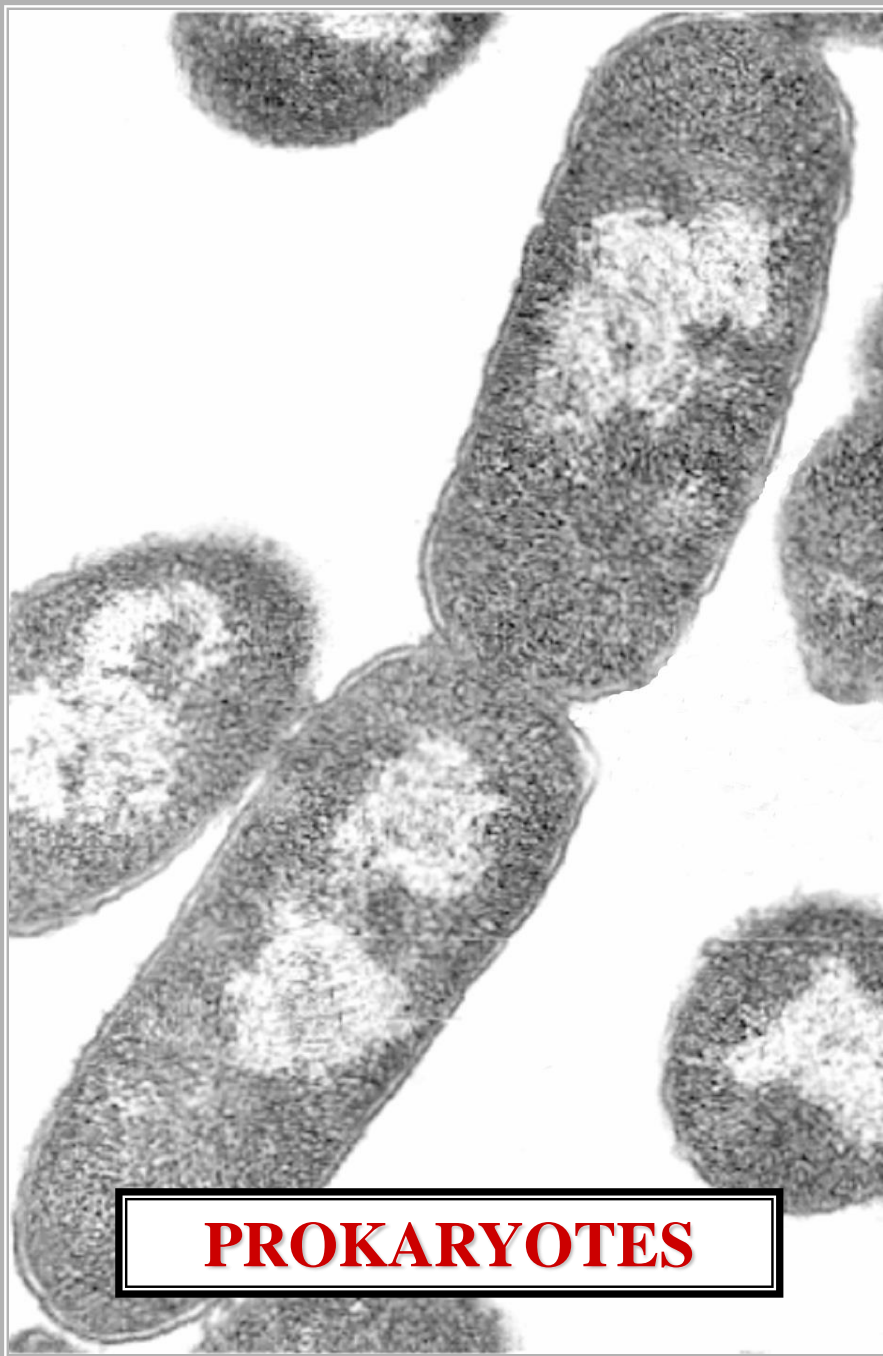


**PROKARYOTES**



**E**

**CELL**



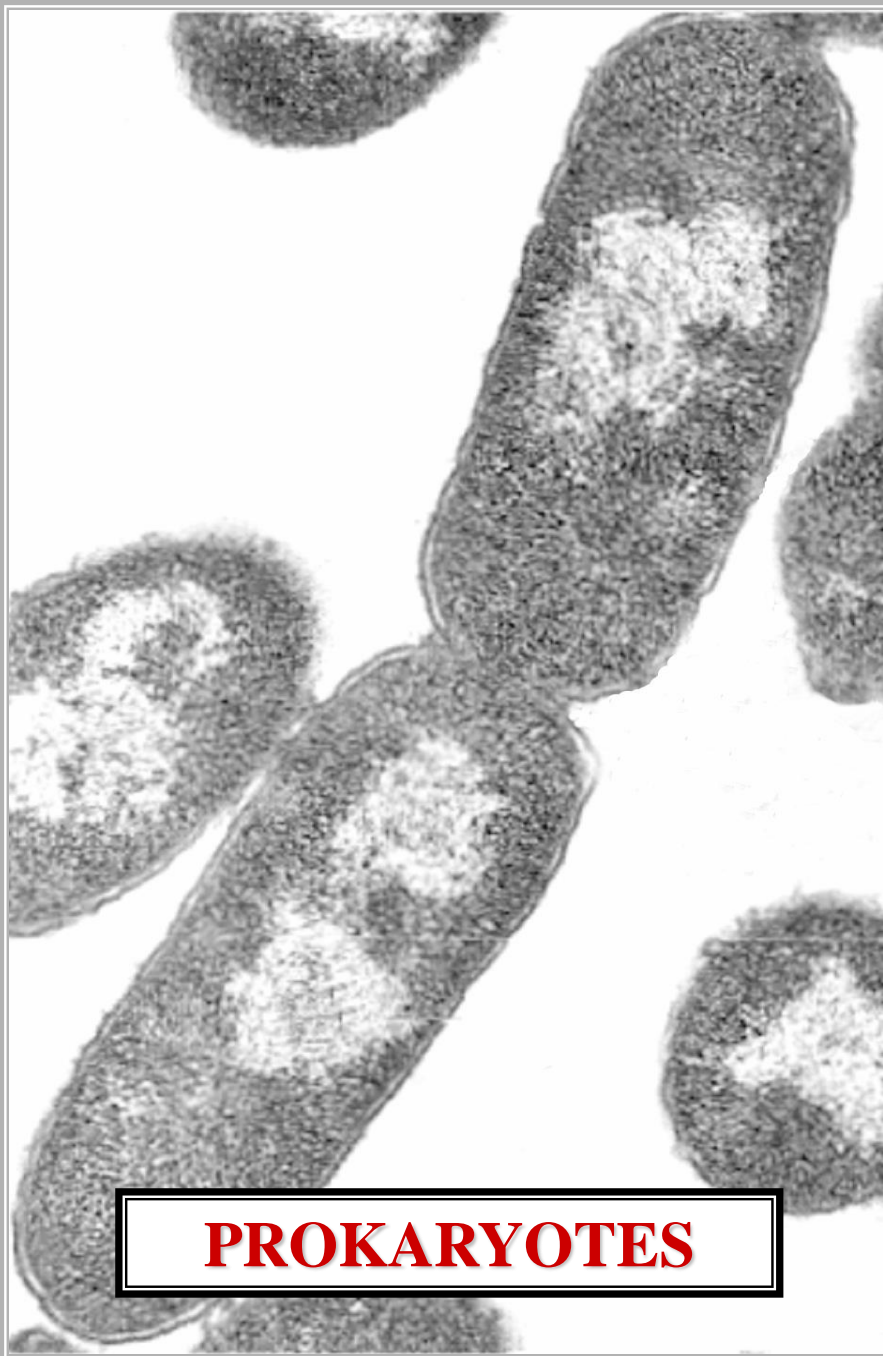
**PROKARYOTES**



**EUKARYOTES**



# PROKARYOTES

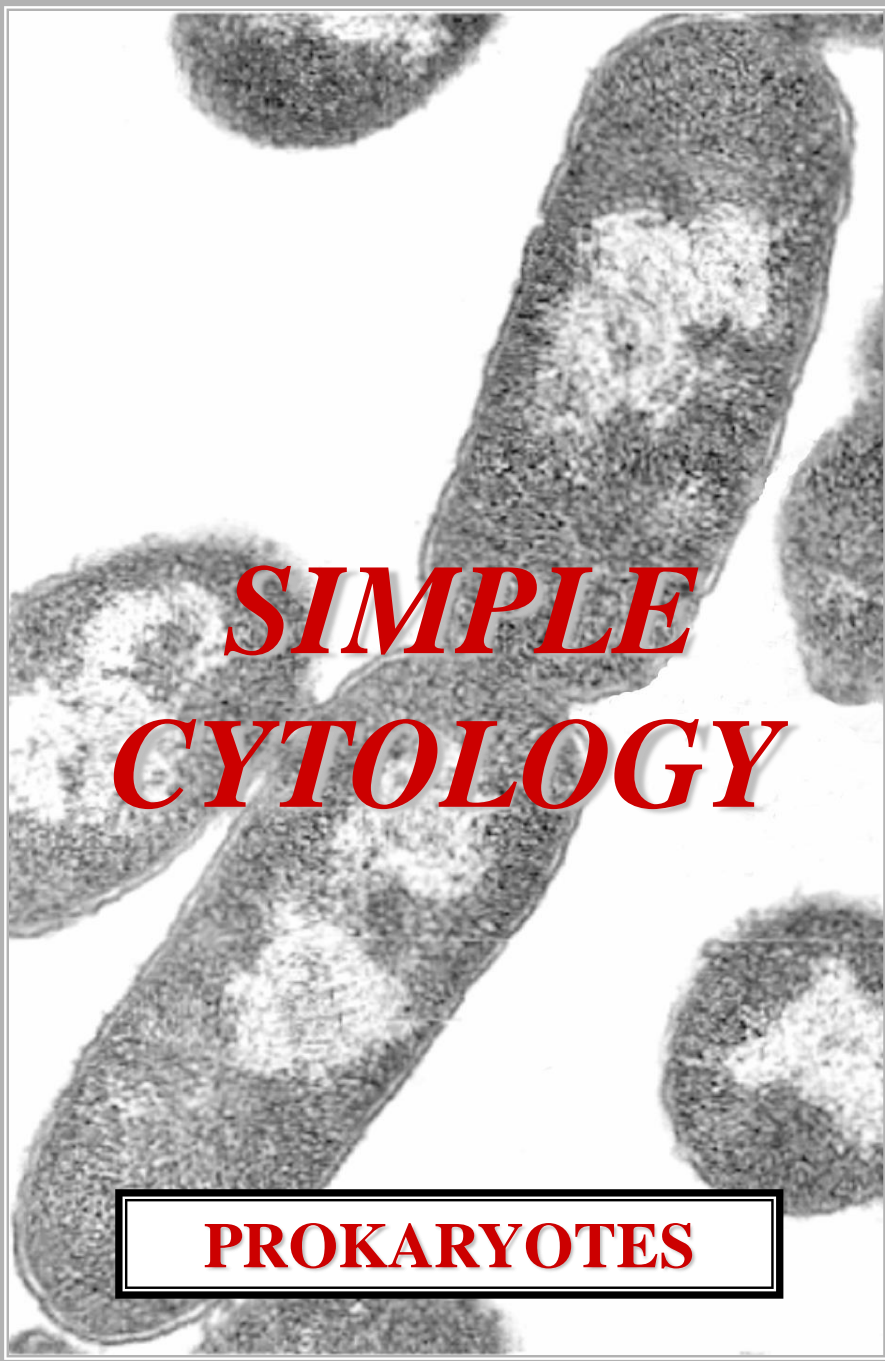


**PROKARYOTES**



**EUKARYOTES**







# EUKARYOTES





***BACTERIA***

**PROKARYOTES**



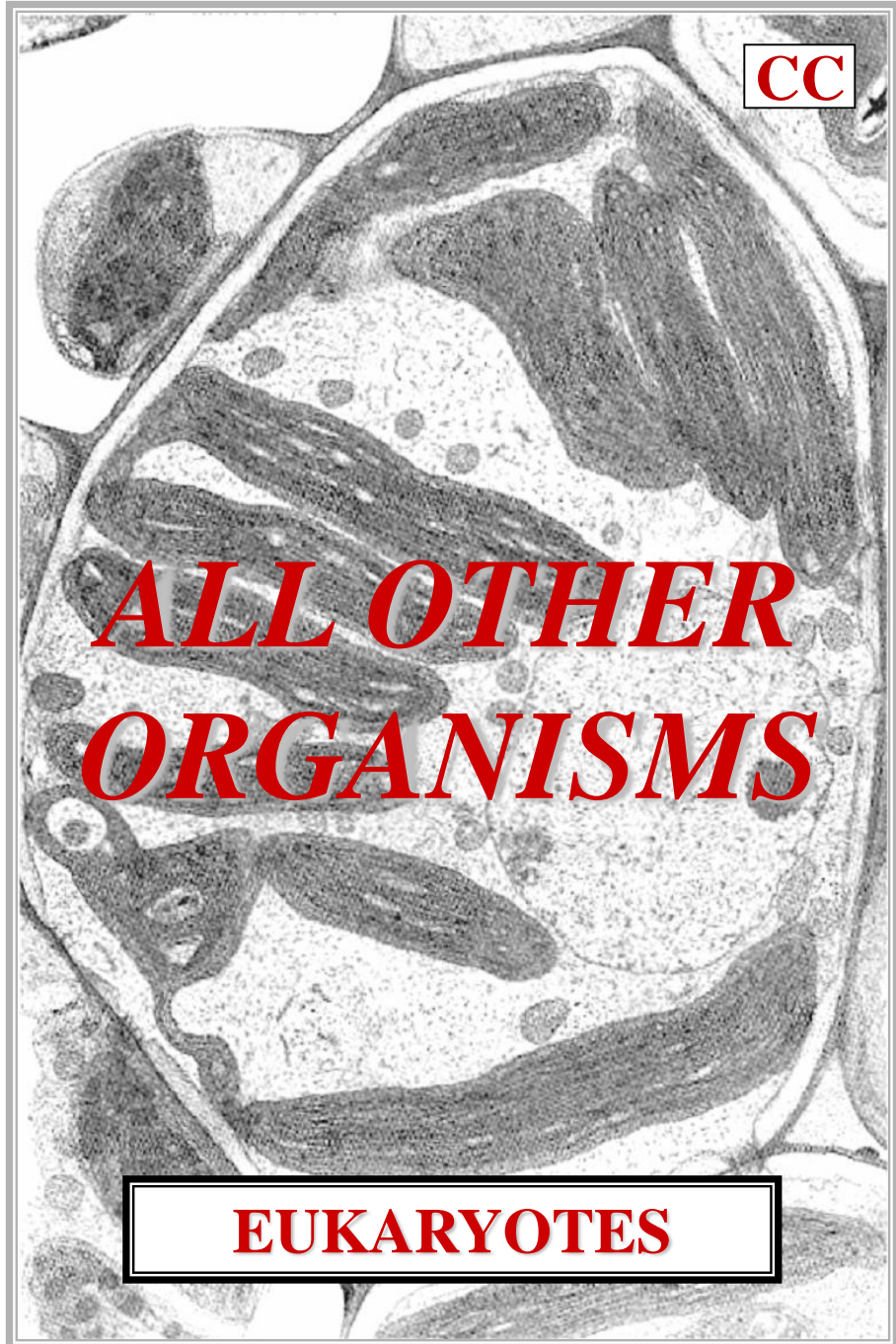
**A**

**EUKARYOTES**



***BACTERIA***

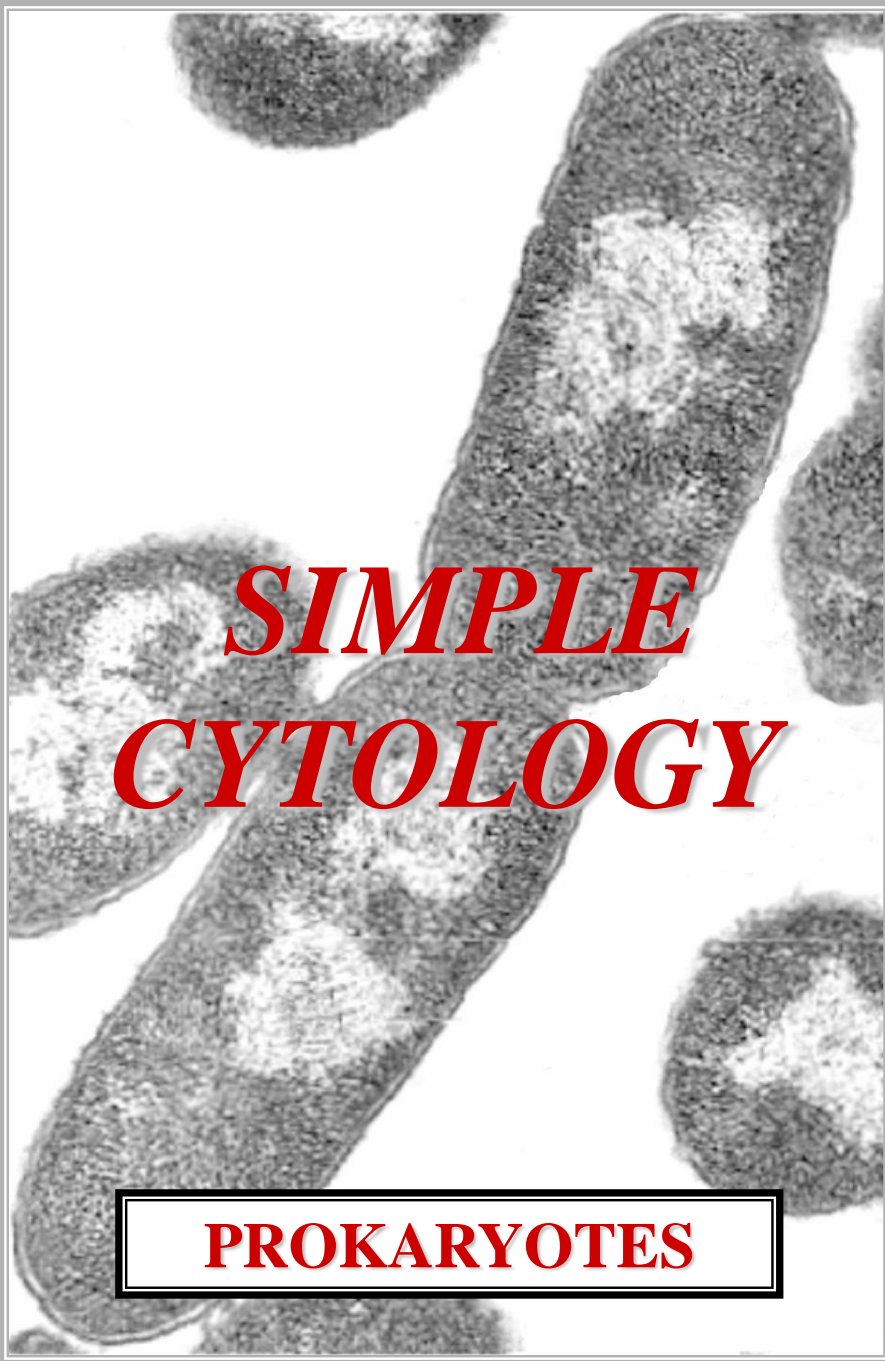
**PROKARYOTES**



**CC**

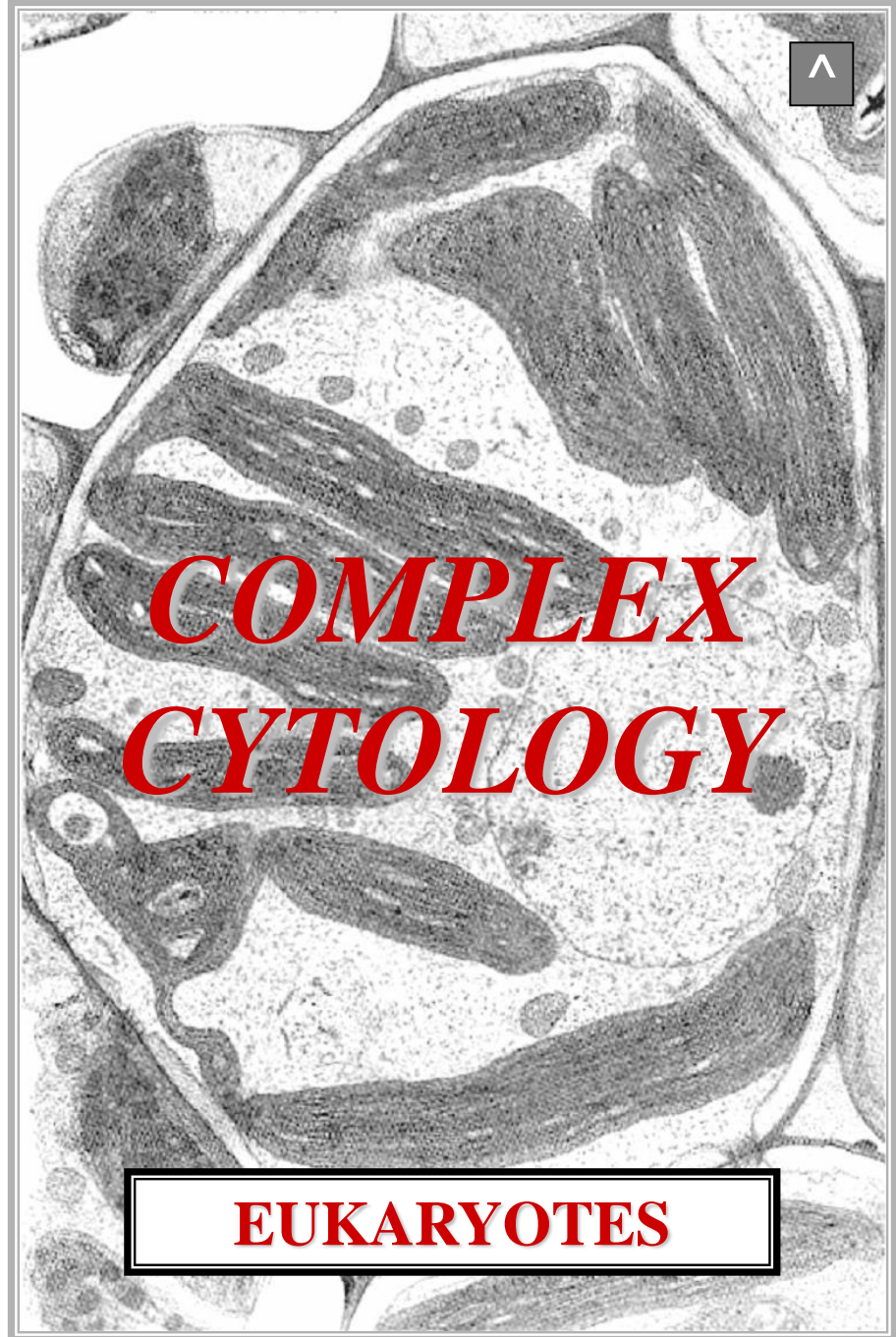
***ALL OTHER  
ORGANISMS***

**EUKARYOTES**



***SIMPLE  
CYTOLOGY***

**PROKARYOTES**



***COMPLEX  
CYTOLOGY***

**EUKARYOTES**



# PROKARYOTES

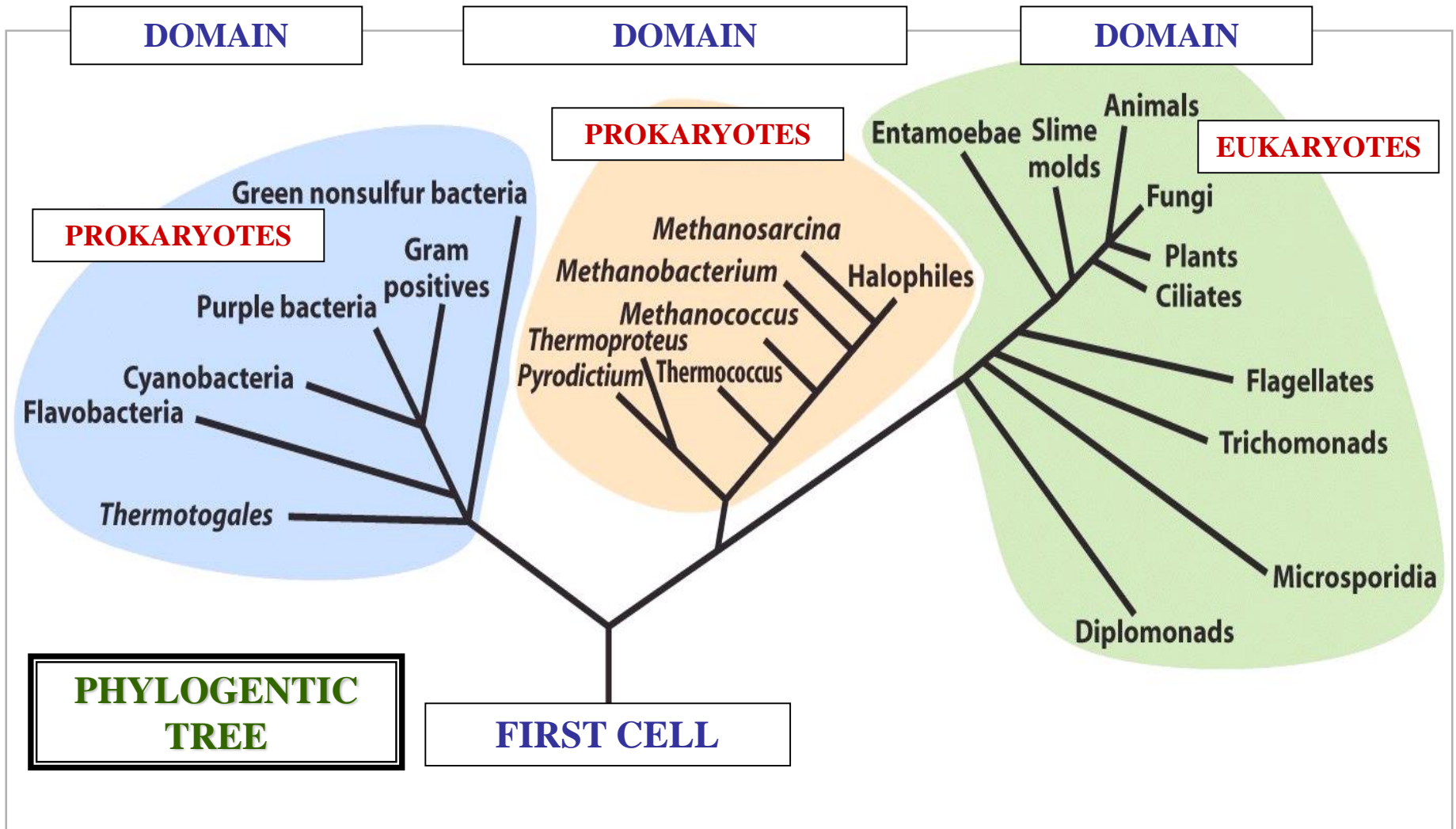


# PROKARYOTE CLASSIFICATION

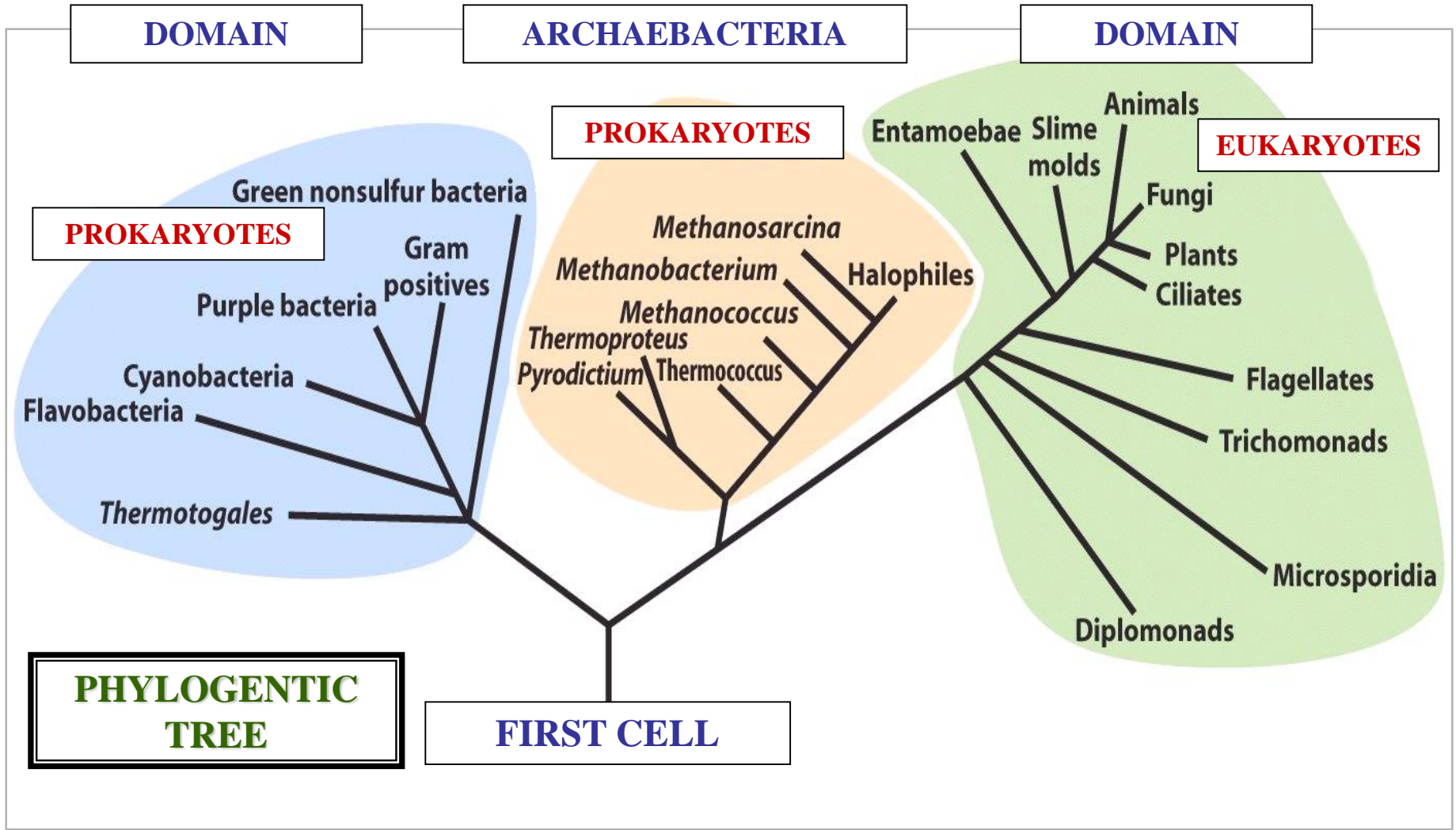


# PROKARYOTE DOMAINS

# PROKARYOTE DOMAINS

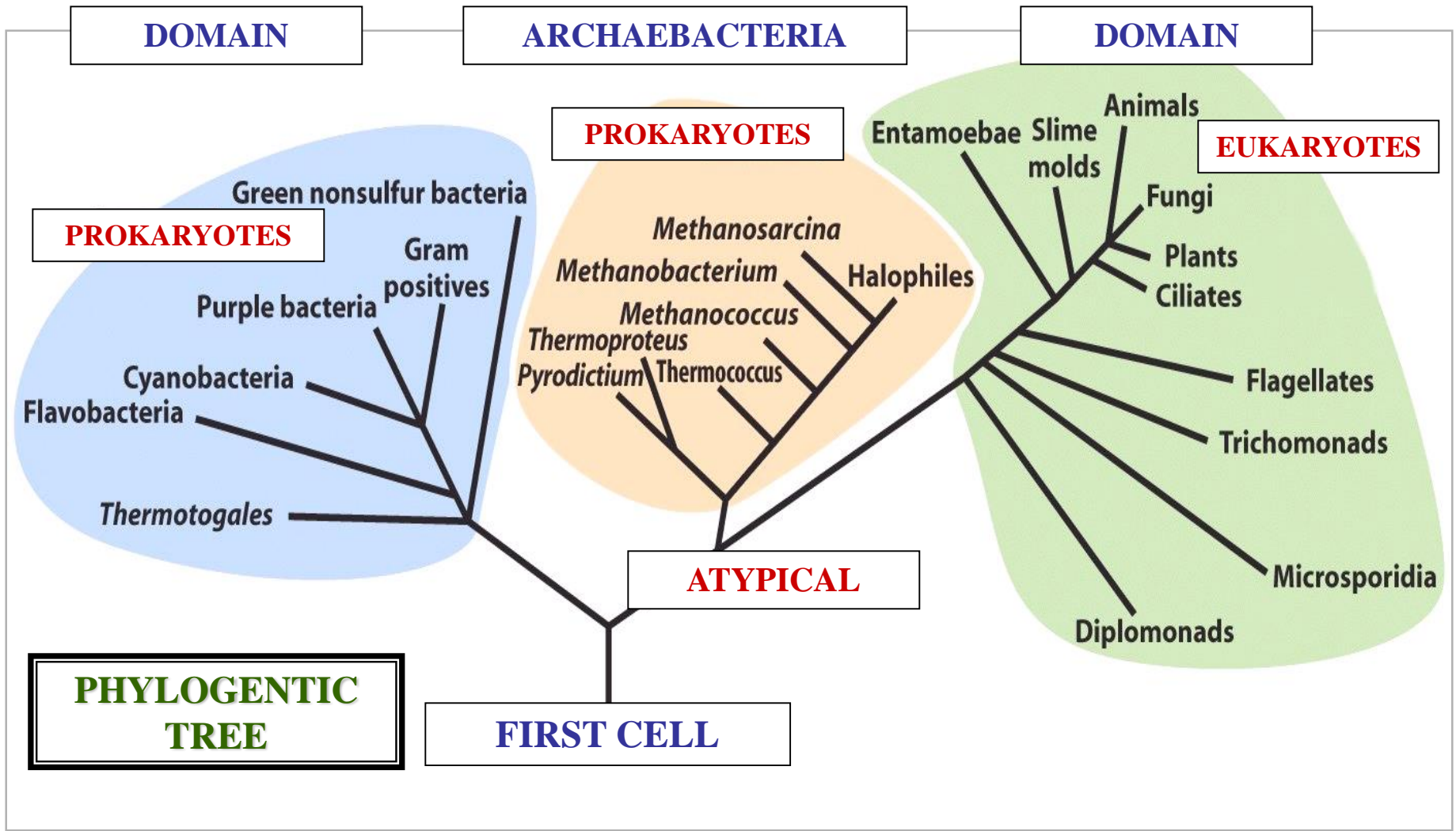


# PROKARYOTE DOMAINS

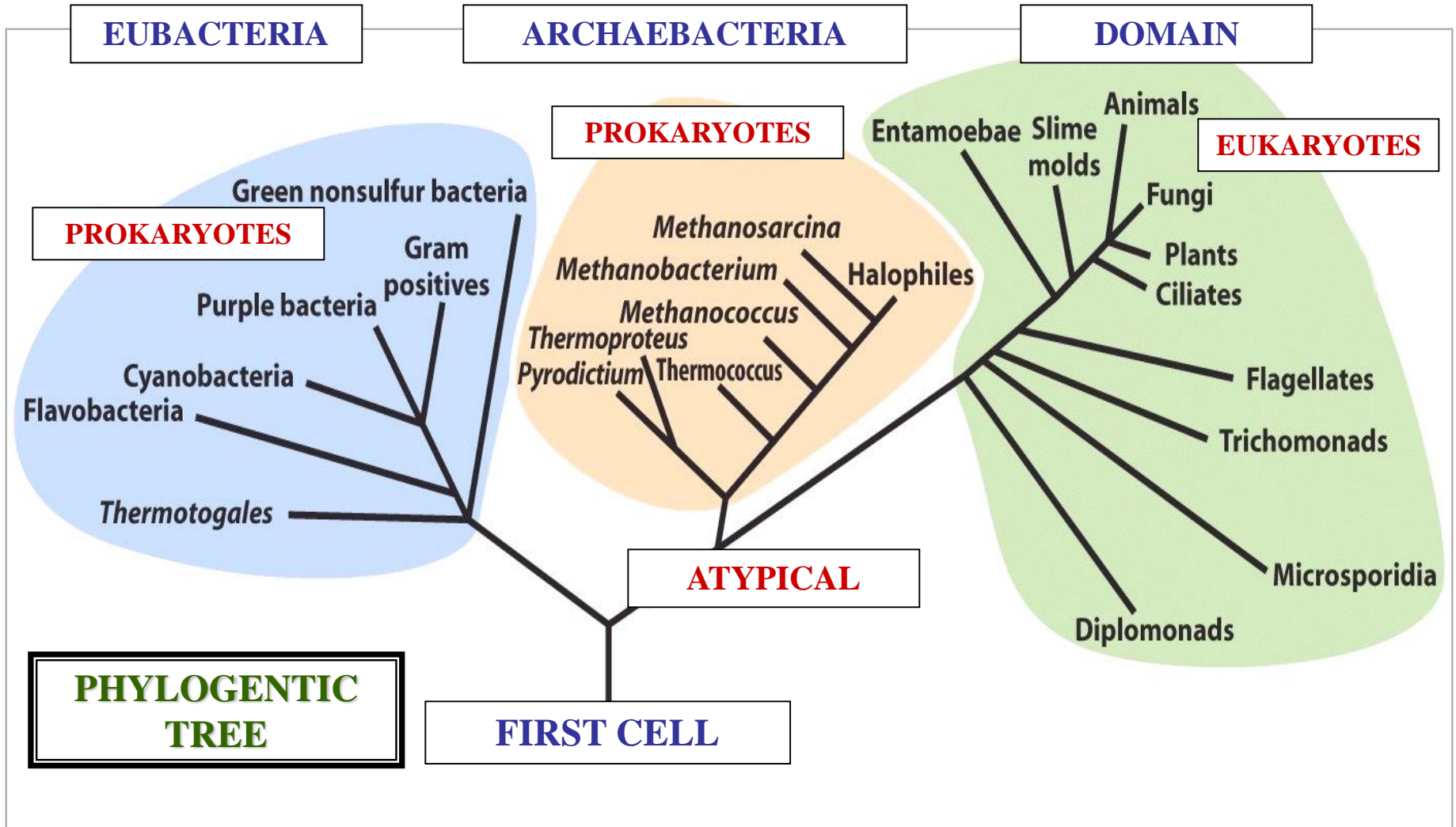




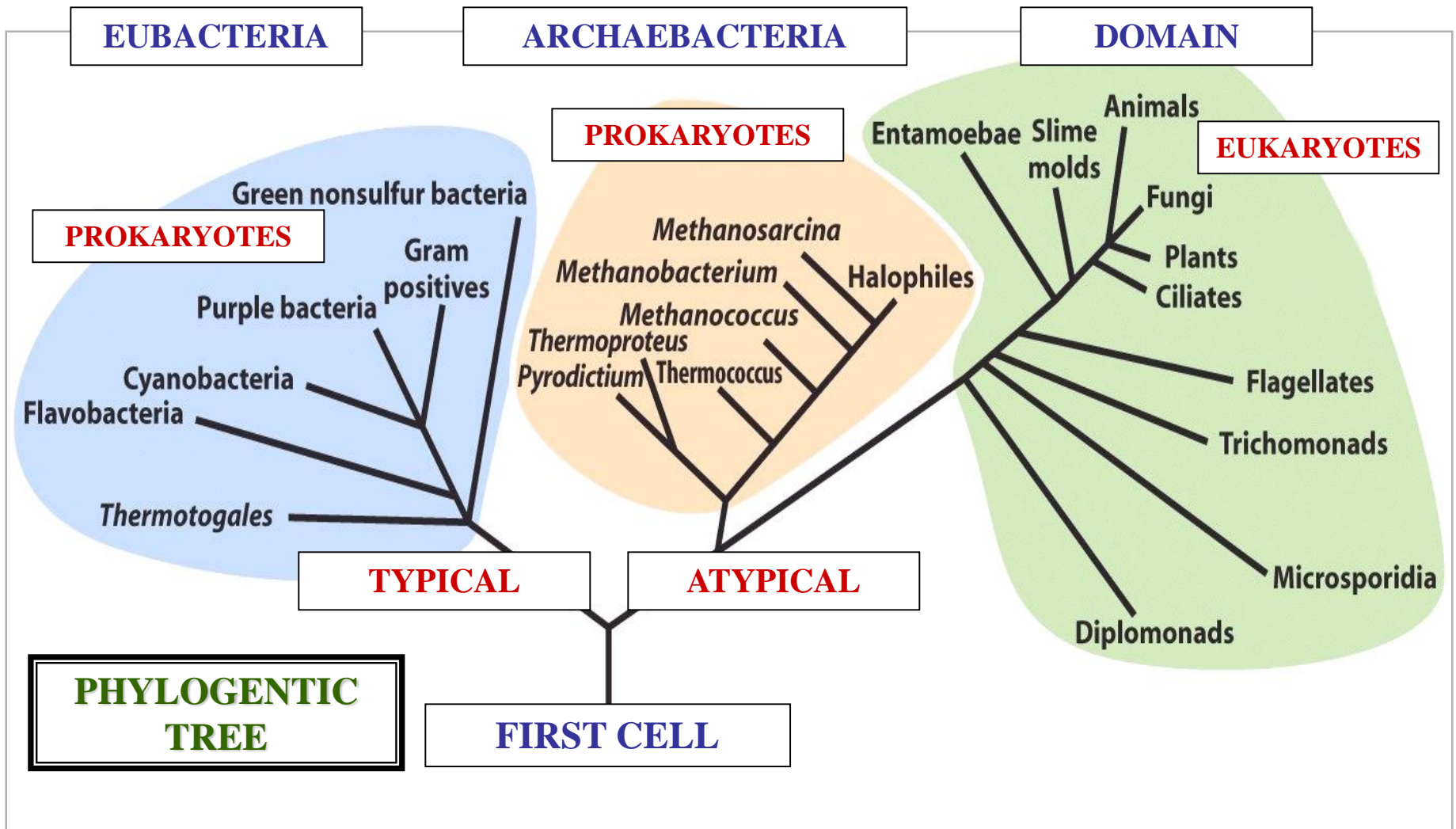
# PROKARYOTE DOMAINS



# PROKARYOTE DOMAINS



# PROKARYOTE DOMAINS





# EUBACTERIA

# EUBACTERIA CELL FORMS

# **EUBACTERIA CELL FORMS**

**COCCOID**

# **EUBACTERIA CELL FORMS**

**EUBACTERIA  
CELL FORMS**

**COCCOID  
BACILLOID**

**EUBACTERIA  
CELL FORMS**

# **EUBACTERIA**

## **CELL FORMS**

**COCCOID**

**BACILLOID**

**SPIRILLOID**

# **EUBACTERIA**

## **CELL FORMS**



**COCCOID**

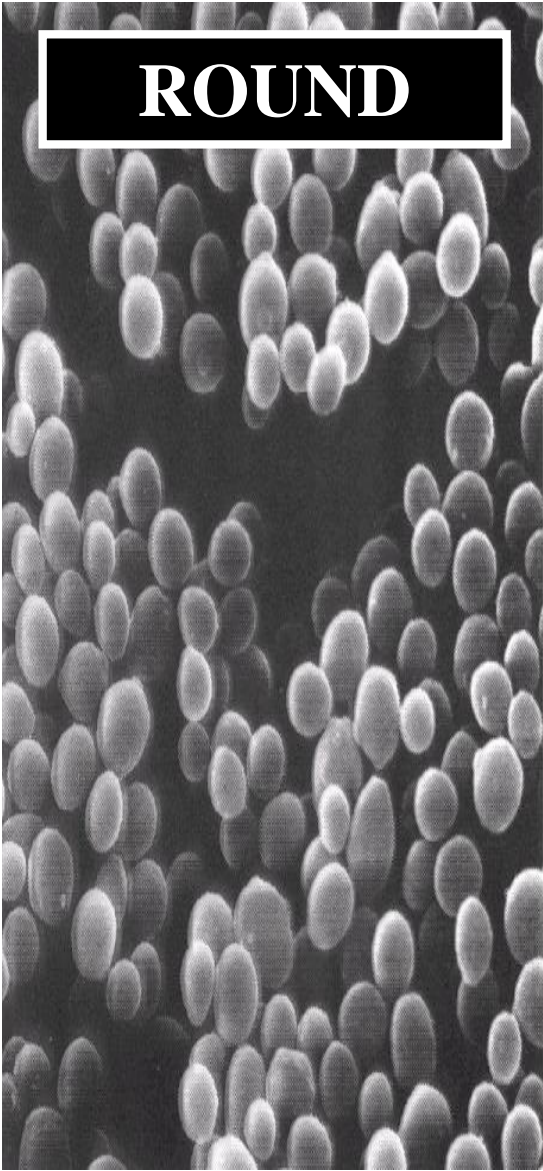
**EUBACTERIA  
CELL FORMS  
COCCOID**



**ROUND IN SHAPE**

**EUBACTERIA  
CELL FORMS  
COCCOID**

**ROUND**



**COCCOID**

**BACILLOID**

**EUBACTERIA  
CELL FORMS  
BACILLOID**

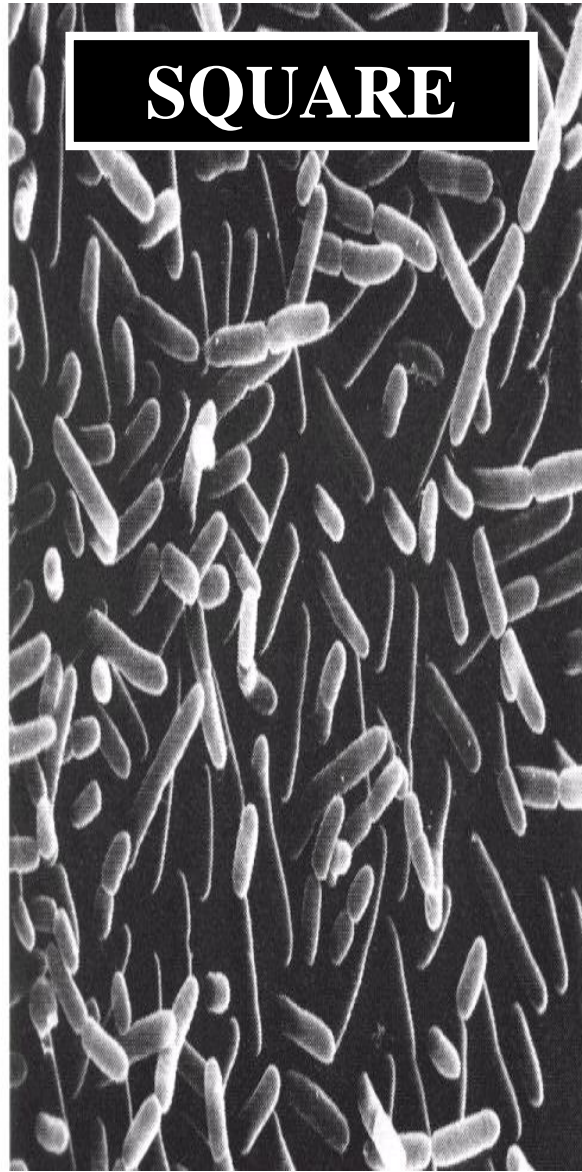
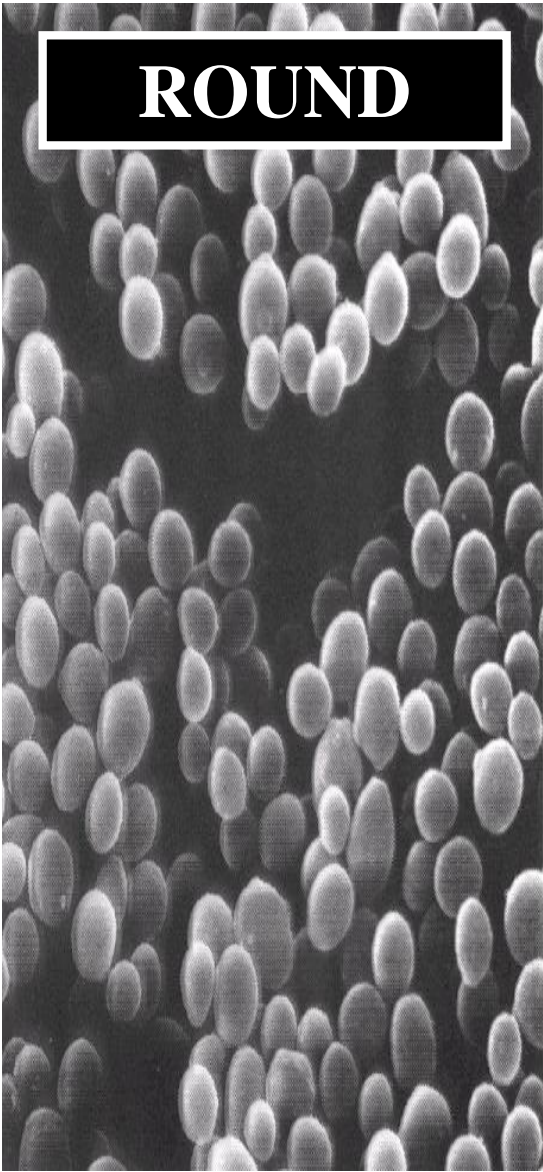


**SQUARE IN SHAPE**

**EUBACTERIA  
CELL FORMS  
BACILLOID**

**ROUND**

**SQUARE**



**COCCOID**

**BACILLOID**

**SPIRILLOID**

**EUBACTERIA  
CELL FORMS  
SPIRILLOID**



**COILED IN SHAPE**

**EUBACTERIA  
CELL FORMS  
SPIRILLOID**



**ROUND**

**SQUARE**

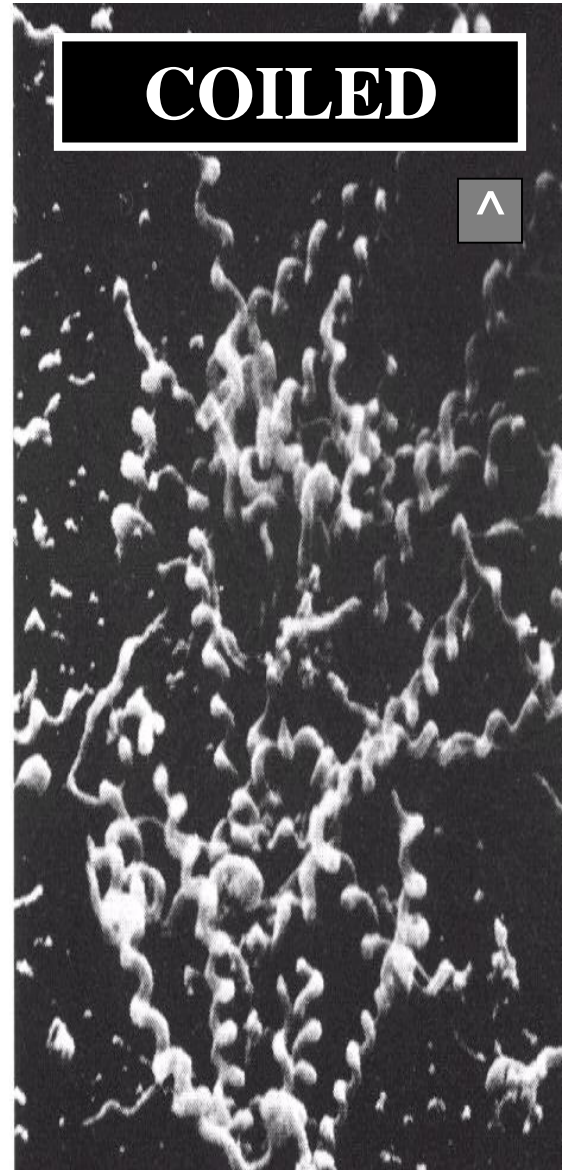
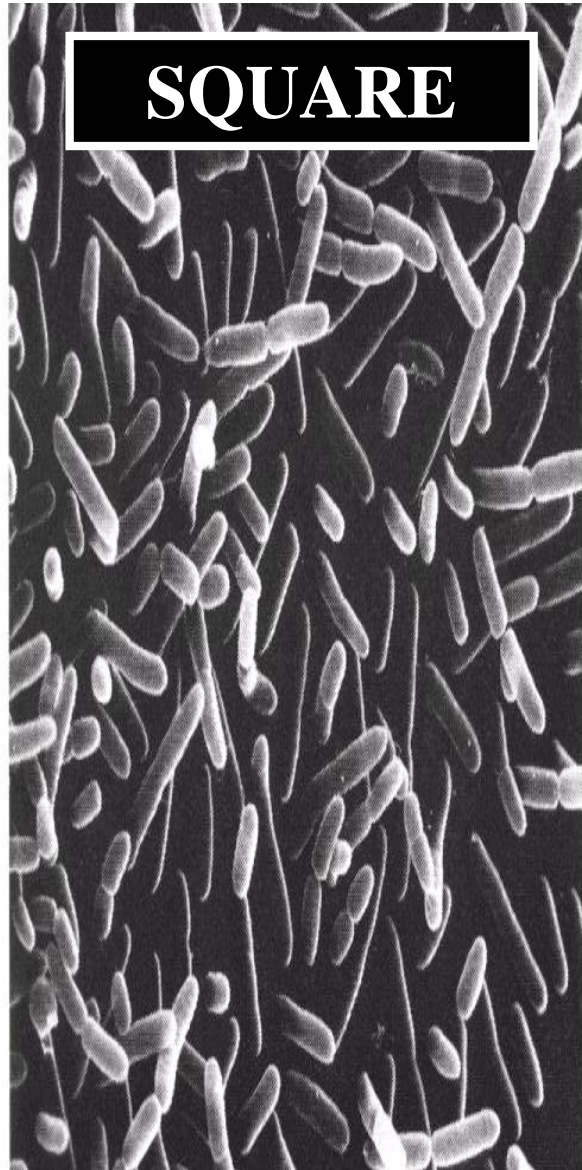
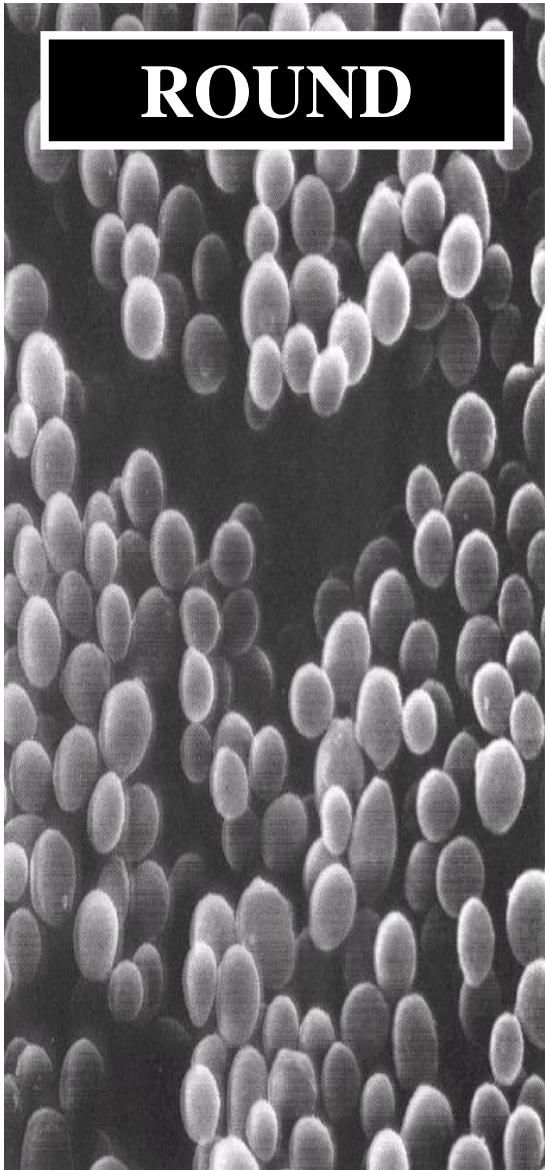
**COILED**



**COCCOID**

**BACILLOID**

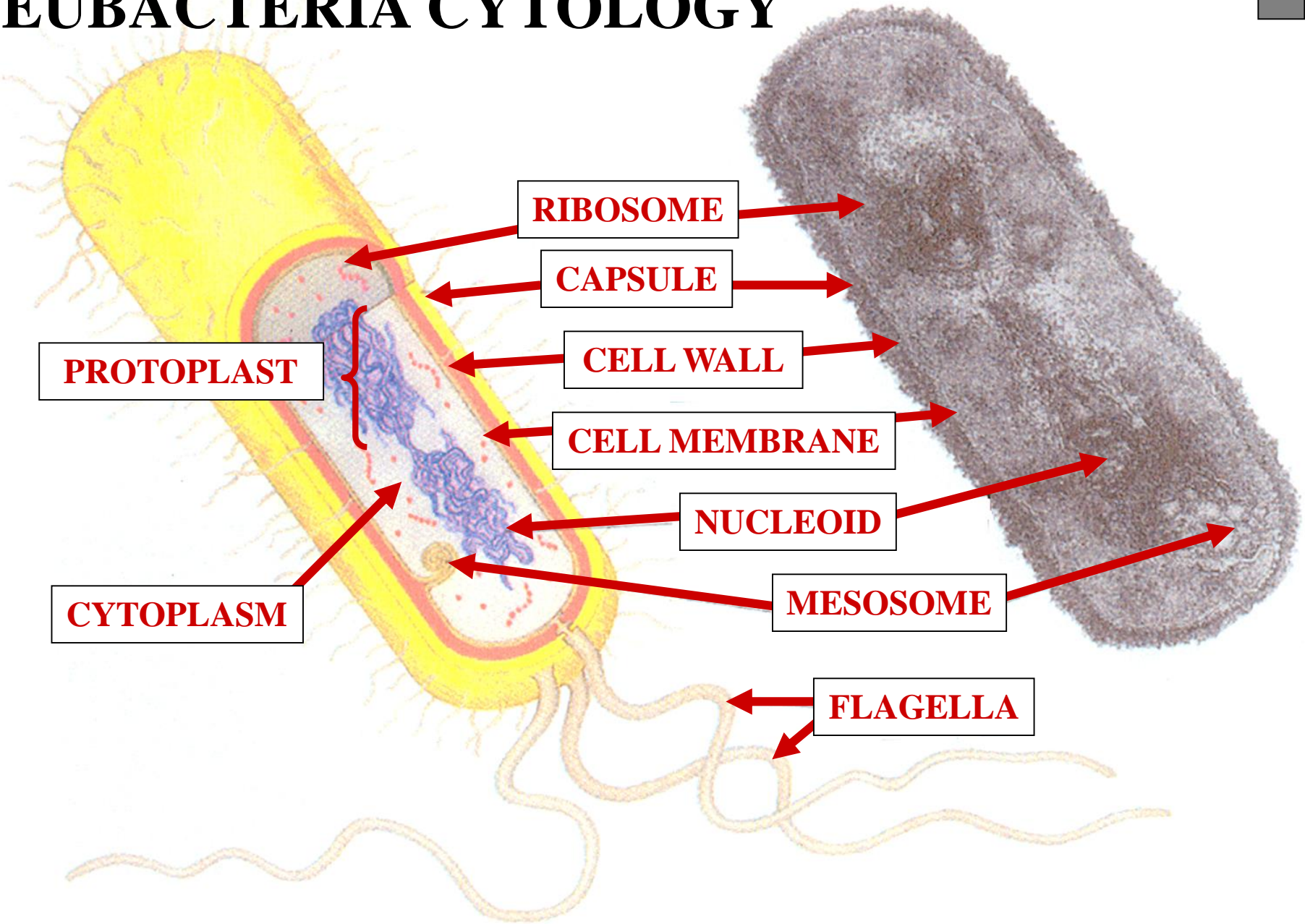
**SPIRILLOID**





# EUBACTERIA CYTOLOGY

# EUBACTERIA CYTOLOGY



# CAPSULE

**CAPSULE**



**CAPSULE**

**NON-LIVING  
GELATINOUS SHEATH**

**CAPSULE**



**CAPSULE**

**NON-LIVING**

**GELATINOUS SHEATH**

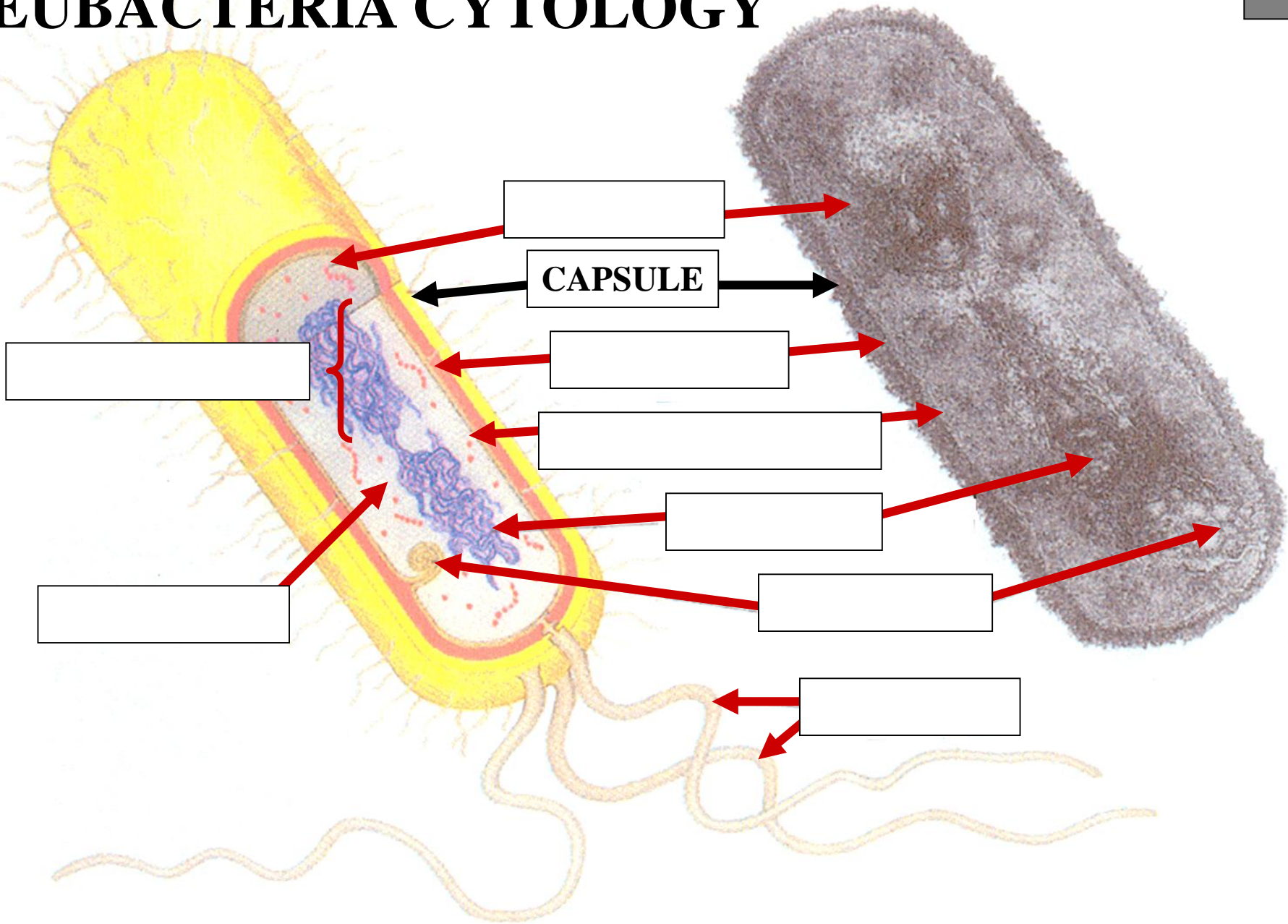
**---**

**INHIBITS DESICCATION**

**WATER LOSS**

**CAPSULE**

# EUBACTERIA CYTOLOGY

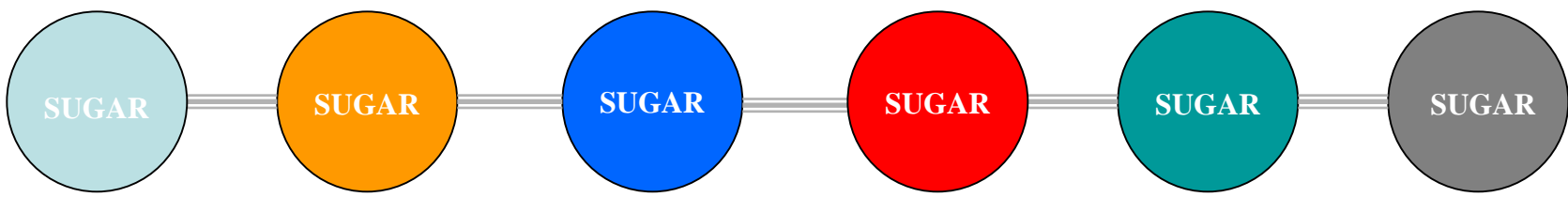






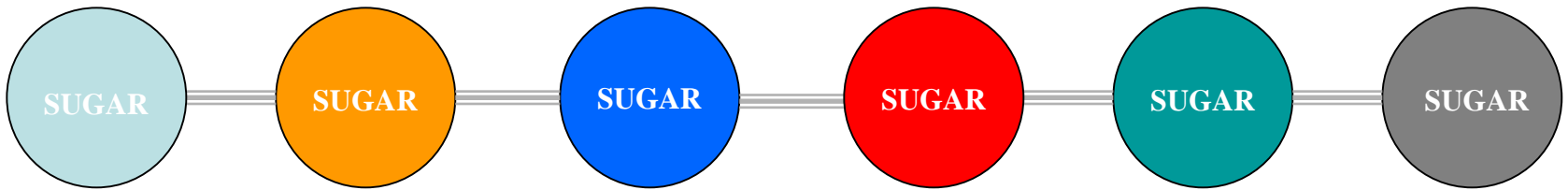
# CAPSULE COMPOSITION

# CAPSULE COMPOSITION



**MONOSACCHARIDE**    **==** = **BOND**

# CAPSULE COMPOSITION

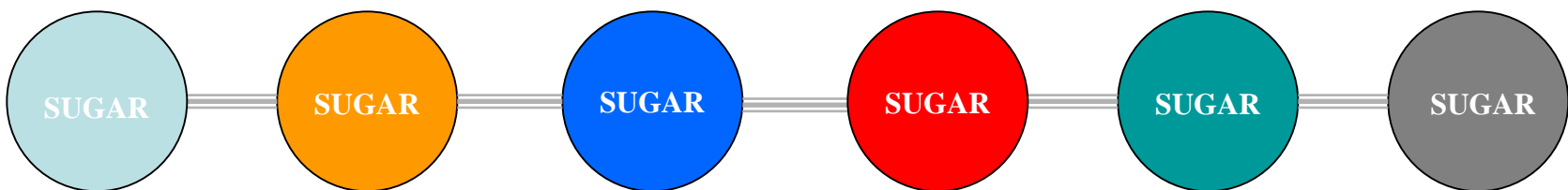


**MONOSACCHARIDE**  $\equiv$  = **BOND**

A large red bracket spans the entire length of the chain of six sugar units. Below the center of this bracket is a large black question mark.

?

# CAPSULE COMPOSITION



**MONOSACCHARIDE**    **==** = **BOND**



**POLYSACCHARIDE**

# CELL WALL

**CELL WALL**



**CELL WALL**

**NON-LIVING RIGID LAYER**

**CELL WALL**



# **CELL WALL**

**NON-LIVING RIGID LAYER**

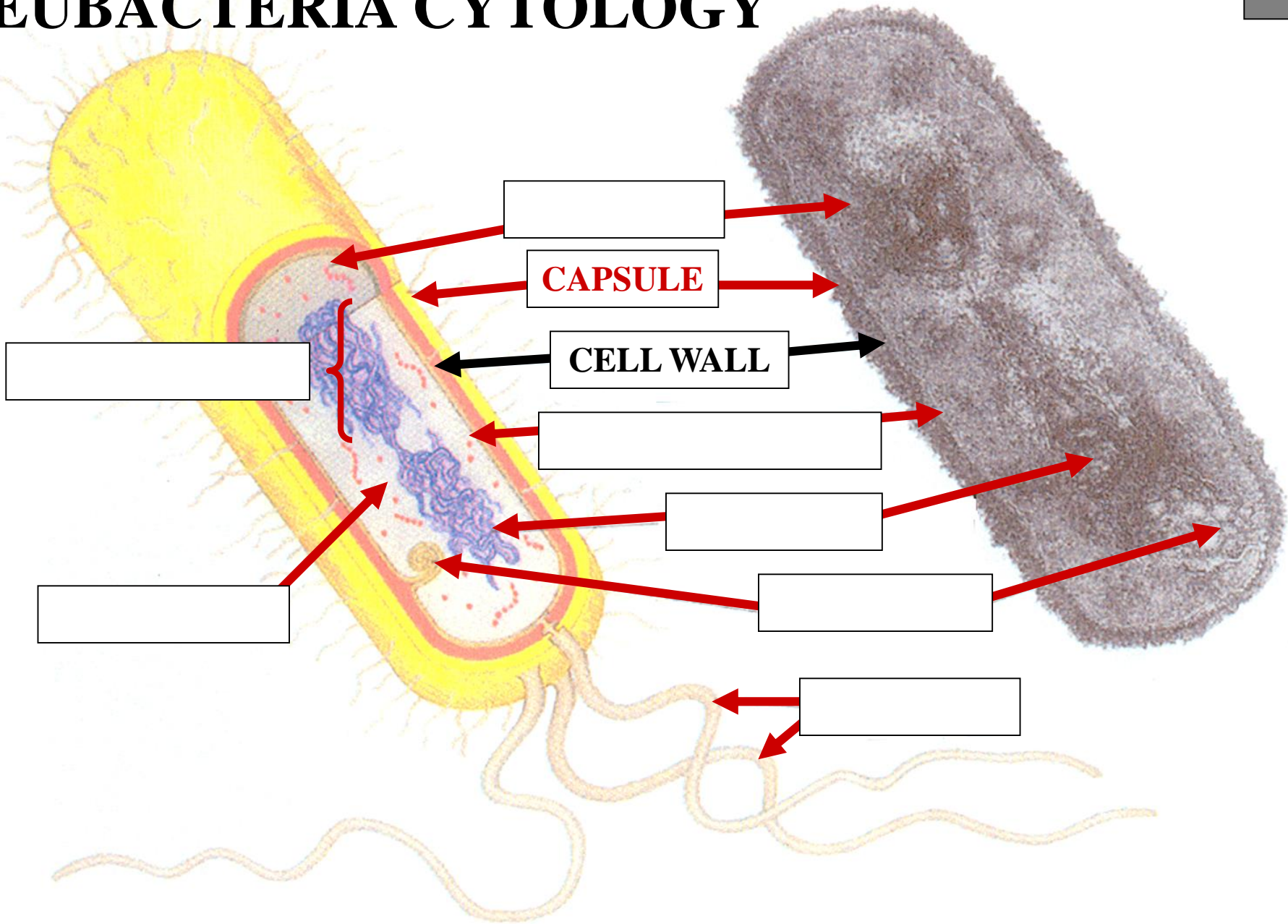
**---**

**SUPPORTS & PROTECTS  
CELL**

**CELL WALL**



# EUBACTERIA CYTOLOGY



# CELL WALL COMPOSITION

# PEPTIDOGLYCANS



**PEPTIDOGLYCANS**

**PROTEIN-SUGAR COMPLEX**

**PEPTIDOGLYCANS**



**PEPTIDOGLYCANS**

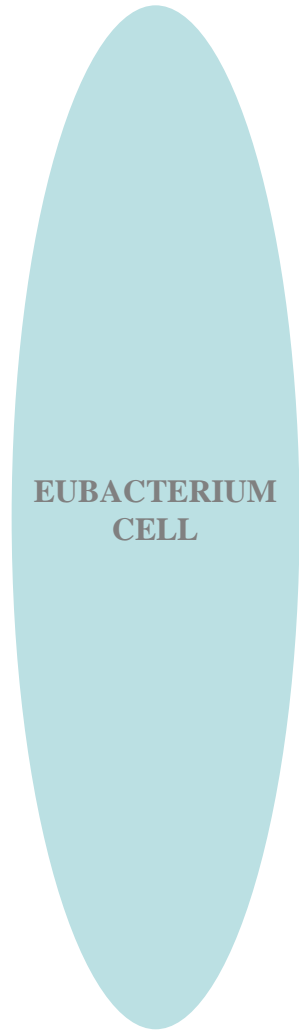
**PROTEIN-SUGAR COMPLEX**

**---**

**ALWAYS PRESENT**

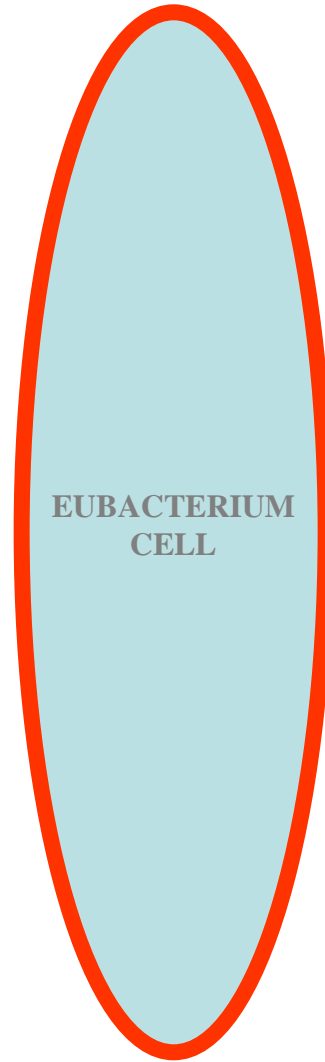
**PEPTIDOGLYCANS**

# EUBACTERIA CELL WALL



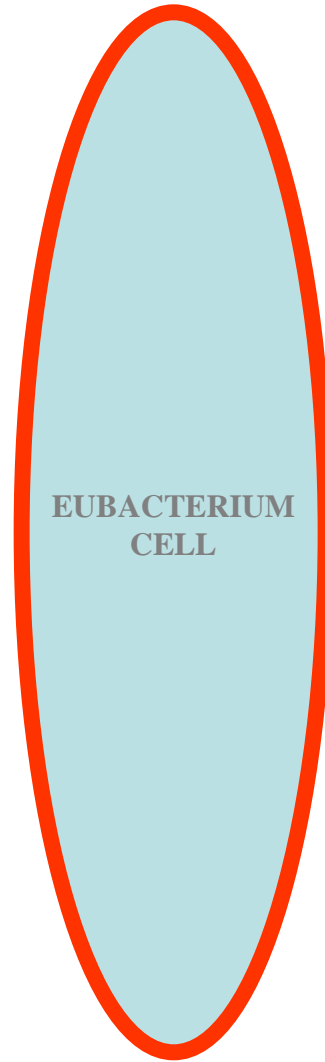
EUBACTERIUM  
CELL

# EUBACTERIA CELL WALL



 = PEPTIDOGLYCANS – **PROTEIN-SUGAR COMPLEX**

# EUBACTERIA CELL WALL



 = PEPTIDOGLYCANS – **ALWAYS PRESENT**



# **LIPOLYLYSACCHARIDES**



**LIPOPOLYSACCHARIDES**

**LIPID-SUGAR COMPLEX**

**LIPOPOLYSACCHARIDES**

**LIPOPOLYSACCHARIDES**

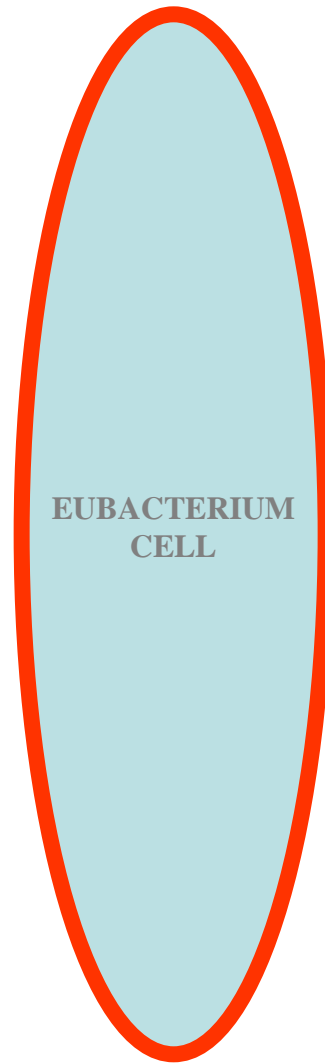
**LIPID-SUGAR COMPLEX**

**---**

**PRESENT OR ABSENT**

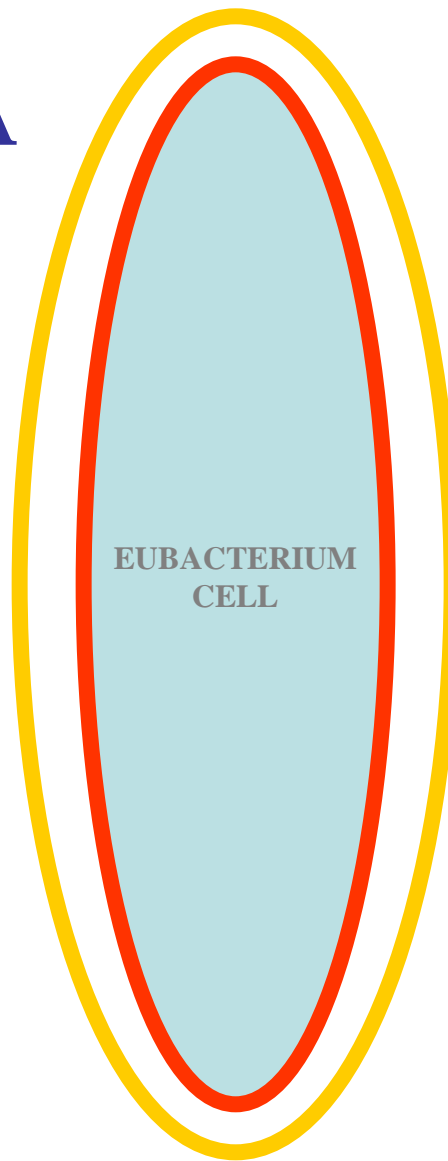
**LIPOPOLYSACCHARIDES**

# EUBACTERIA CELL WALL



 = PEPTIDOGLYCANS – **ALWAYS PRESENT**

# EUBACTERIA CELL WALL

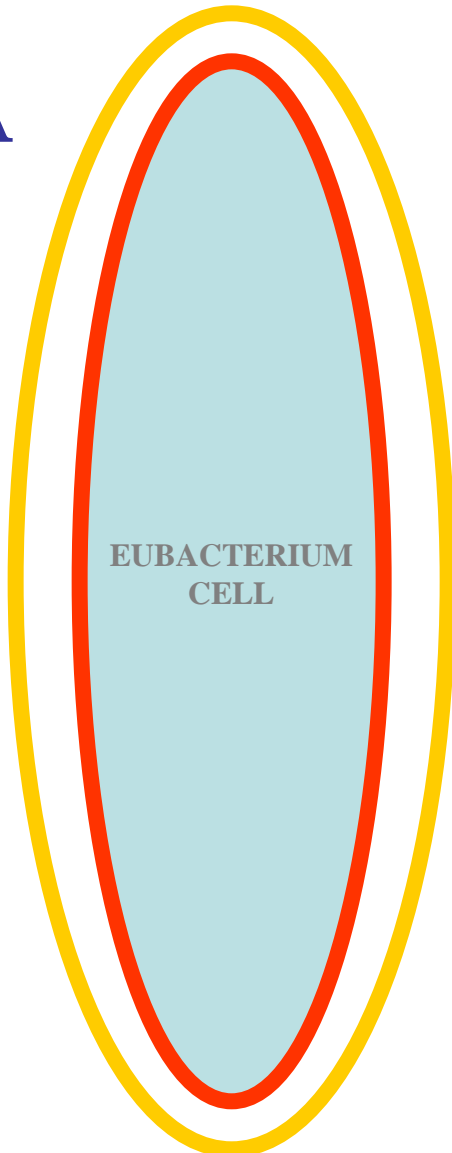


 = PEPTIDOGLYCANS – **ALWAYS PRESENT**

 = LIPOPOLYSACCHARIDES – **LIPID-SUGAR COMPLEX**



# EUBACTERIA CELL WALL



 = PEPTIDOGLYCANS – **ALWAYS PRESENT**

 = LIPOPOLYSACCHARIDES – **PRESENT OR ABSENT**

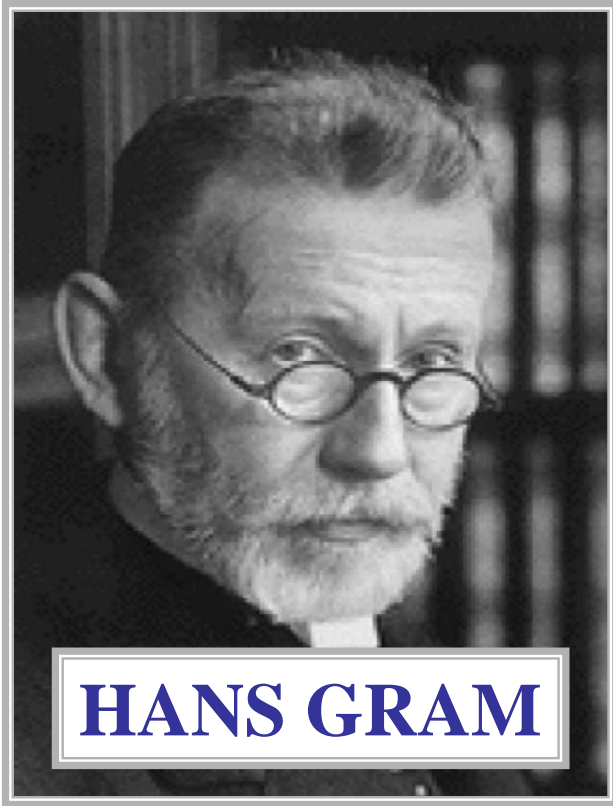
# GRAM STAIN TEST



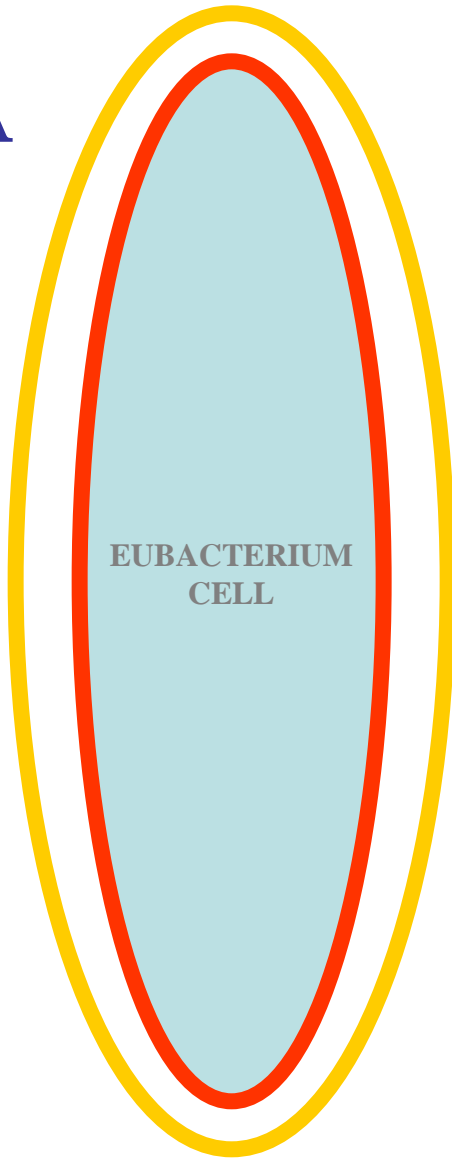
# GRAM STAIN TEST



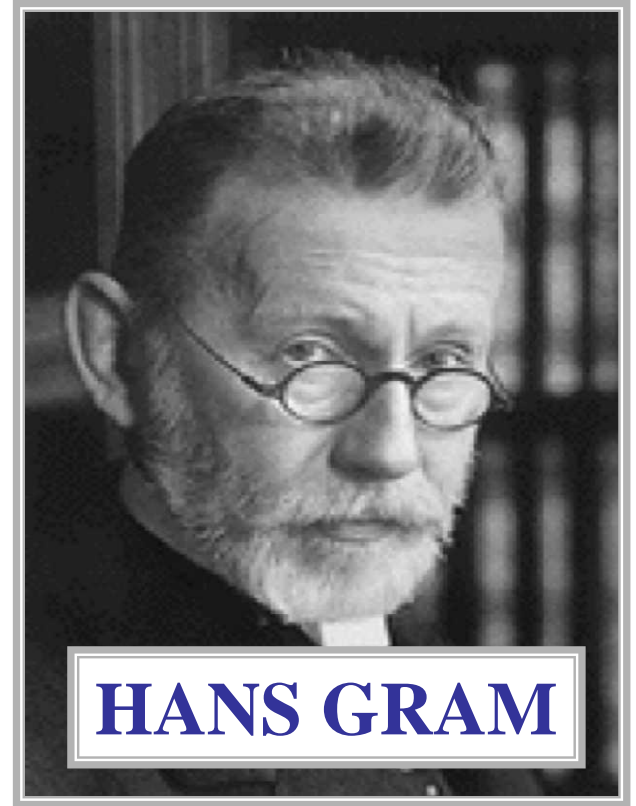
# EUBACTERIA CELL WALL



**HANS GRAM**



# EUBACTERIA CELL WALL



**HANS GRAM**



= PEPTIDOGLYCANS – ALWAYS PRESENT



= LIPOPOLYSACCHARIDES – PRESENT OR ABSENT





# **GRAM STAIN TEST**

**VIOLET DYE TEST FOR  
EXPOSED PEPTIDOGLYCANS**

**GRAM STAIN TEST**

# GRAM STAIN TEST

VIOLET DYE TEST FOR  
EXPOSED PEPTIDOGLYCANS

----

EXPOSED PEPTIDOGLYCANS  
ABSORB VIOLET DYE  
TURN VIOLET

GRAM STAIN TEST

# GRAM STAIN TEST APPLIED



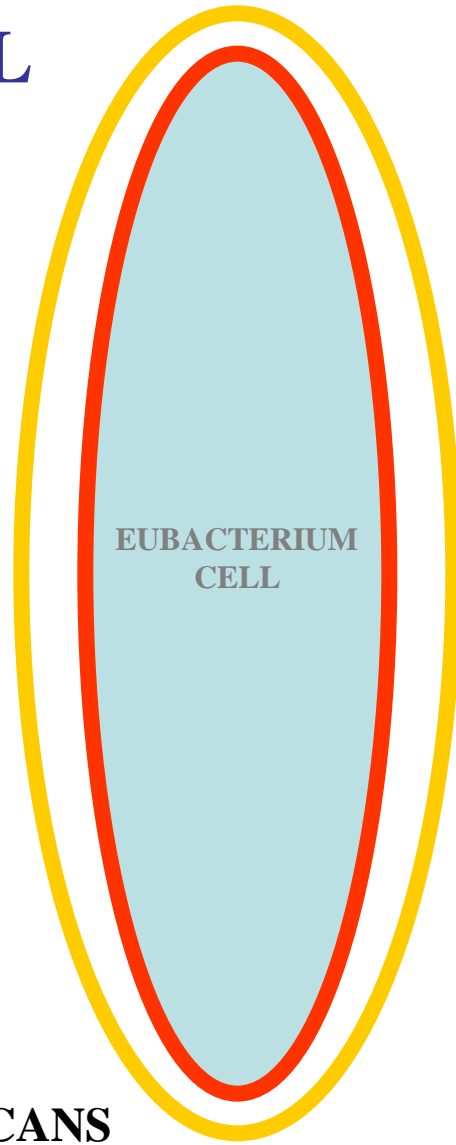
**GRAM  
STAIN TEST**

**EUBACTERIUM**

**LIPOPOLYSACCHARIDES**

**ABSENT**

# EUBACTERIUM CELL WALL



 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL

EX



EUBACTERIUM  
CELL

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



EUBACTERIUM  
CELL

**EXPOSED  
PEPTIDOGLYCANS**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**



# EUBACTERIUM CELL WALL



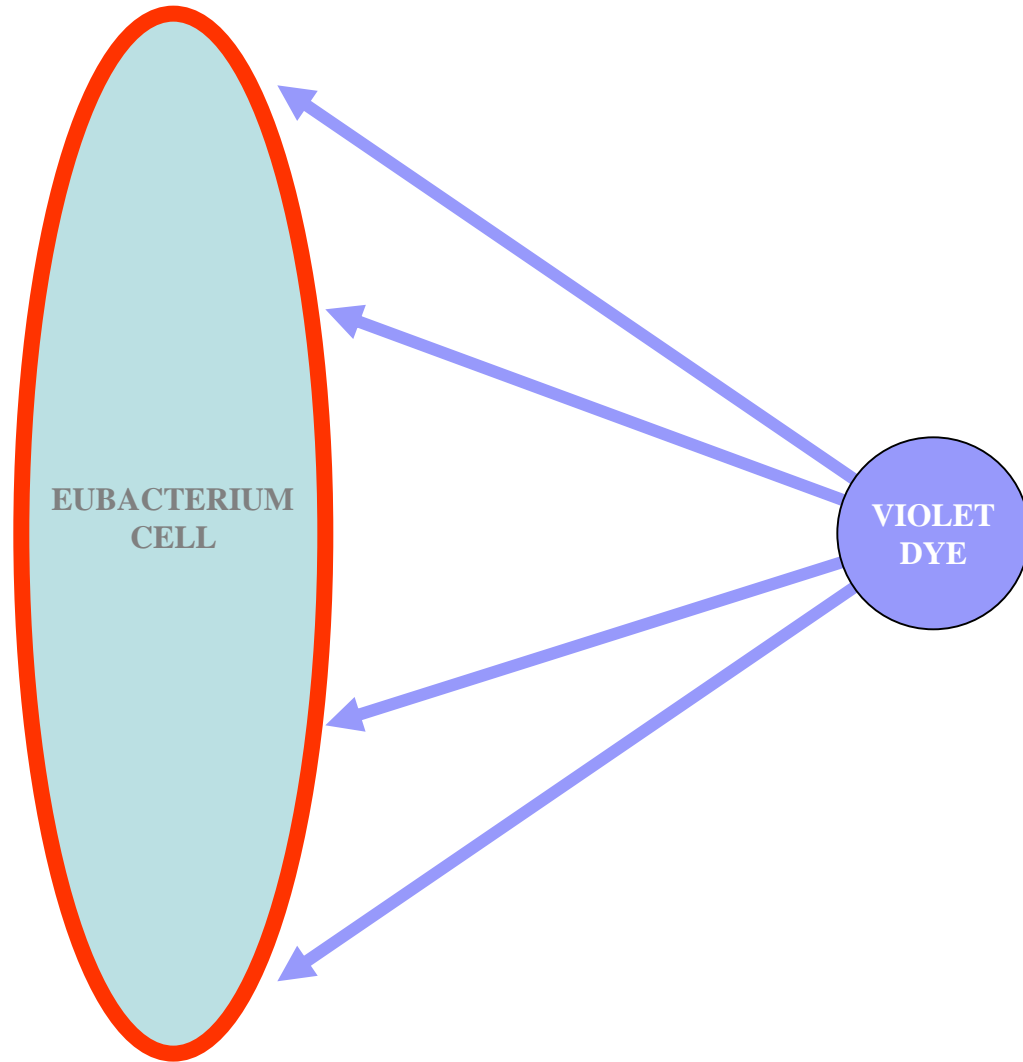
EUBACTERIUM  
CELL

VIOLET  
DYE

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



EUBACTERIUM  
CELL

**PEPTIDOGLYCANS**  
**ABSORB**  
**VIOLET DYE**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



EUBACTERIUM  
CELL

**PEPTIDOGLYCANS**  
**TURN**  
**VIOLET**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



EUBACTERIUM  
CELL

**CELL WALL  
TURNS  
VIOLET**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



EUBACTERIUM  
CELL

?

**EUBACTERIUM**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



EUBACTERIUM  
CELL

**GRAM +  
EUBACTERIUM**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**



**GRAM  
STAIN TEST**

**EUBACTERIUM**

**LIPOPOLYSACCHARIDES**

**PRESENT**



# EUBACTERIUM CELL WALL

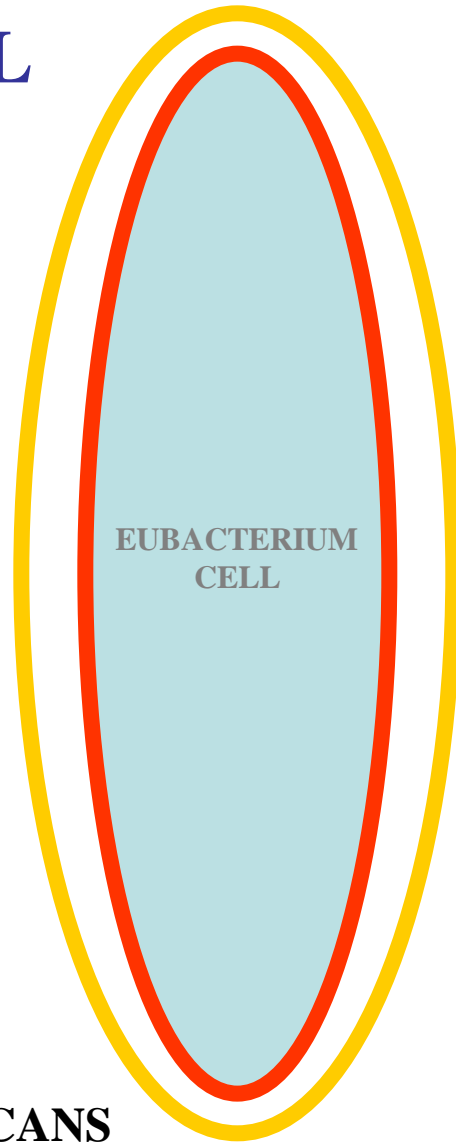


EUBACTERIUM  
CELL

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

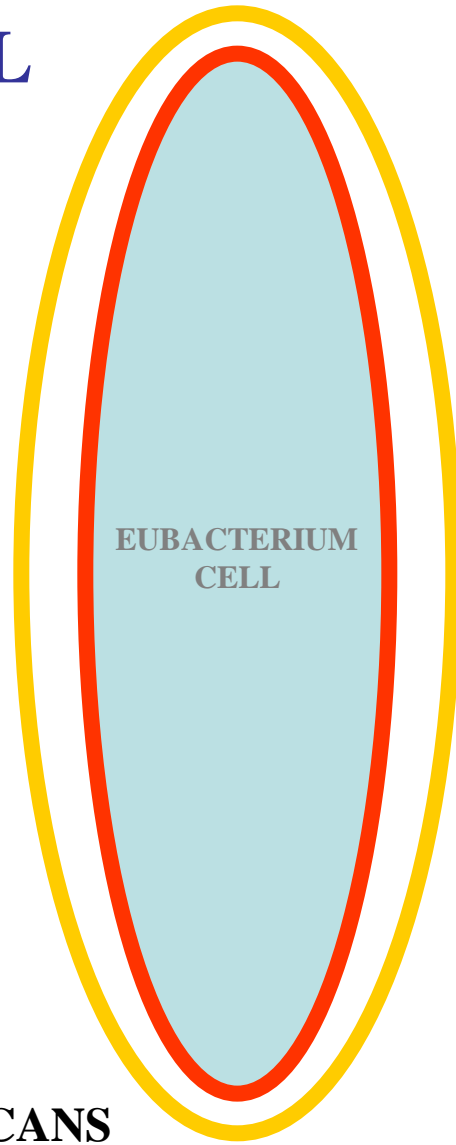
# EUBACTERIUM CELL WALL



 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

# EUBACTERIUM CELL WALL

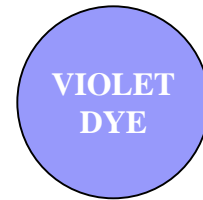
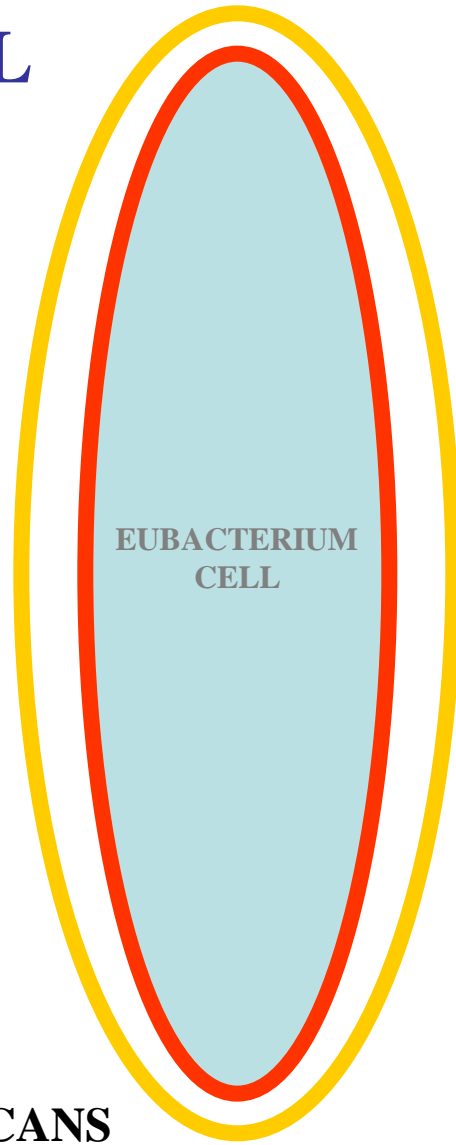


**NON-EXPOSED  
PEPTIDOGLYCANS**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

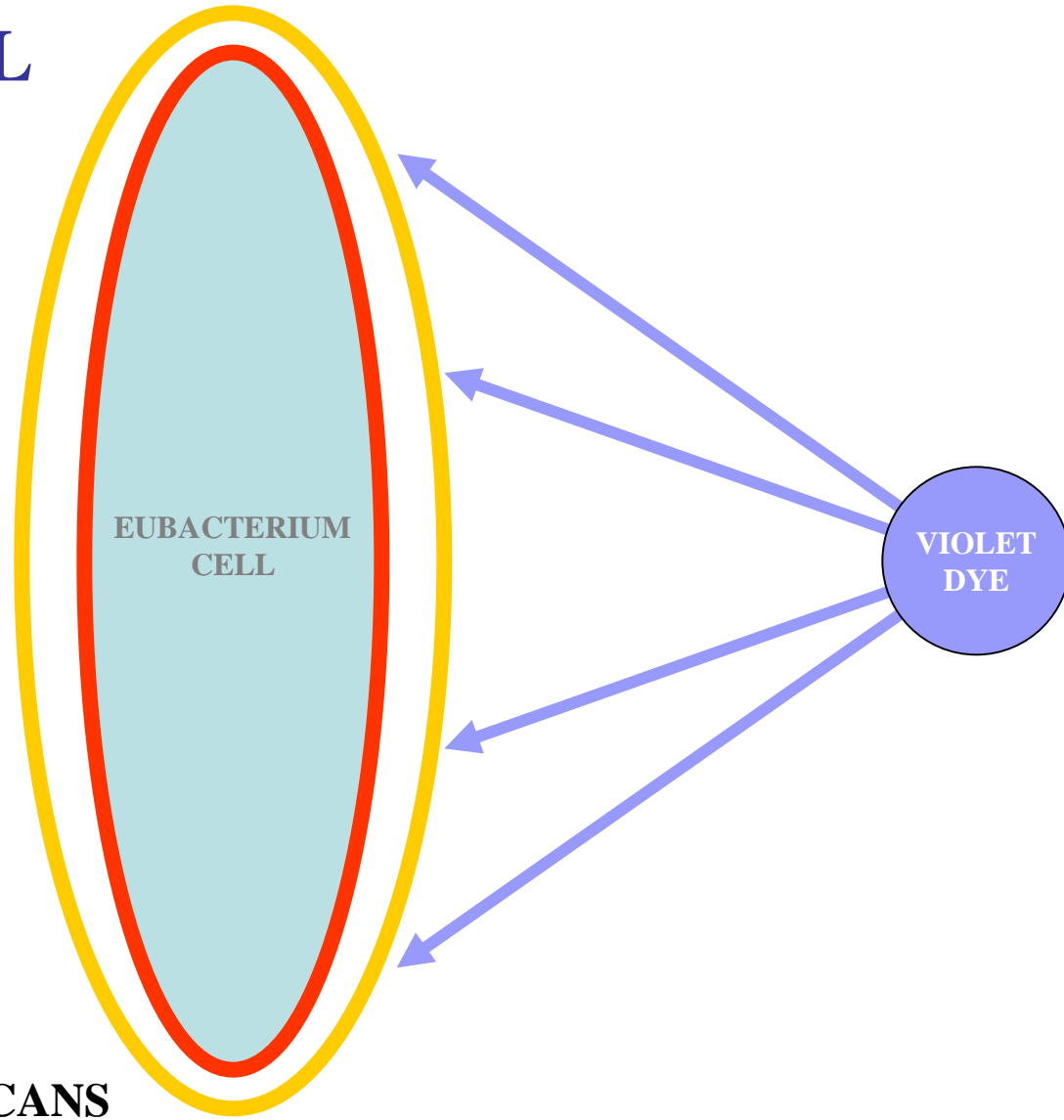
# EUBACTERIUM CELL WALL



 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

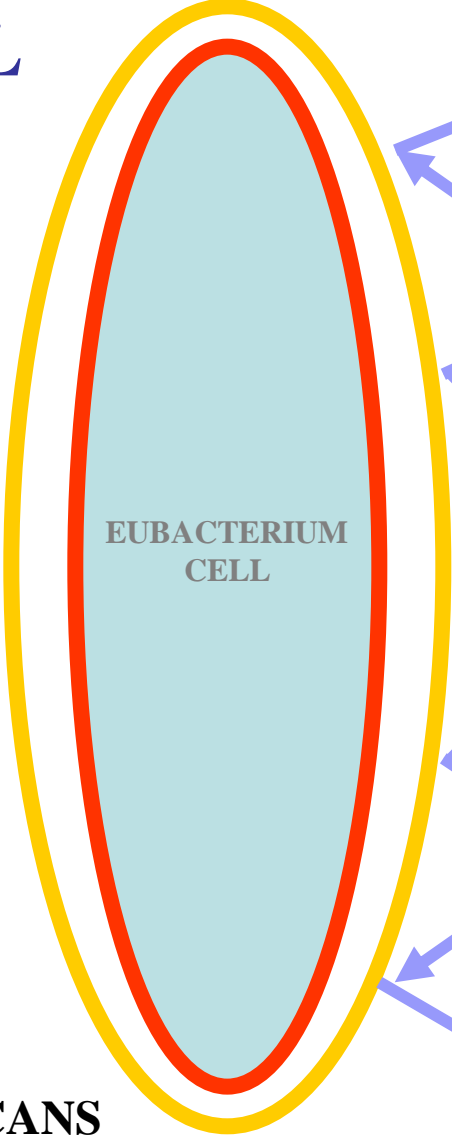
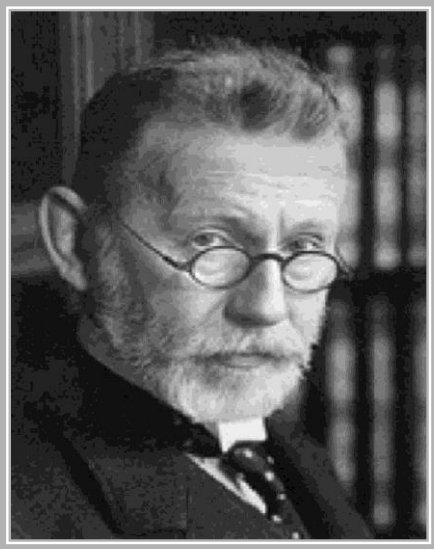
# EUBACTERIUM CELL WALL



 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

# EUBACTERIUM CELL WALL




**REPEL  
VIOLET DYE**

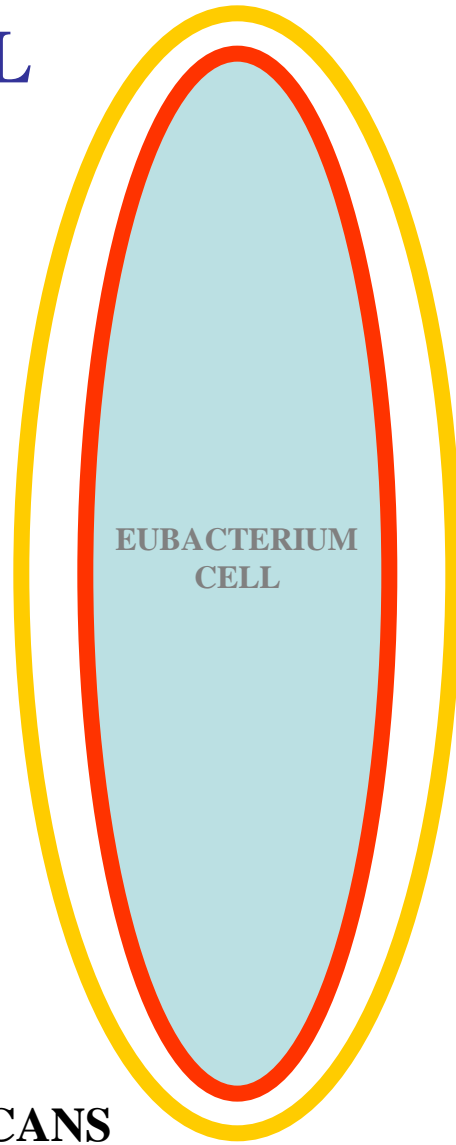
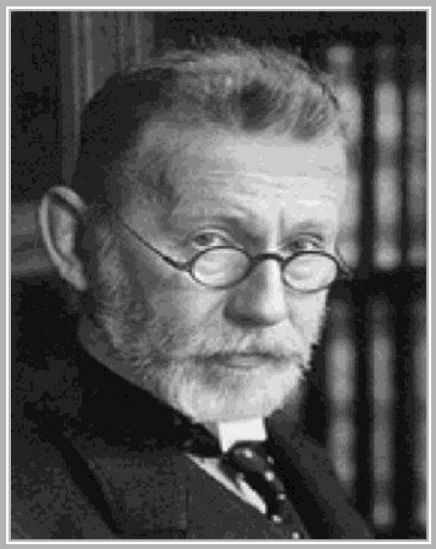
**D**

**VIOLET  
DYE**

**REPEL  
VIOLET DYE**

-  = PEPTIDOGLYCANS
-  = LIPOPOLYSACCHARIDES – **PRESENT**

# EUBACTERIUM CELL WALL

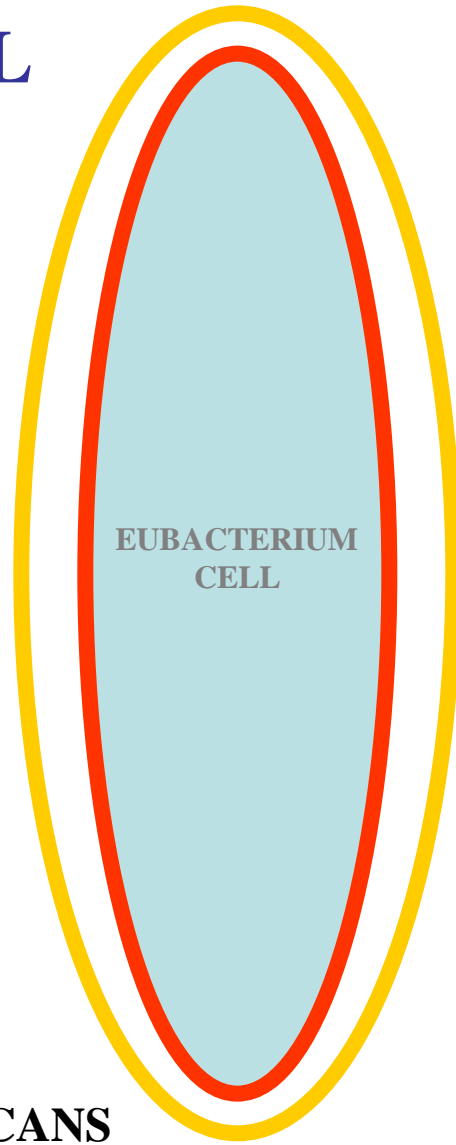


**PEPTIDOGLYCANS**  
***DO NOT* ABSORB**  
**VIOLET DYE**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

# EUBACTERIUM CELL WALL



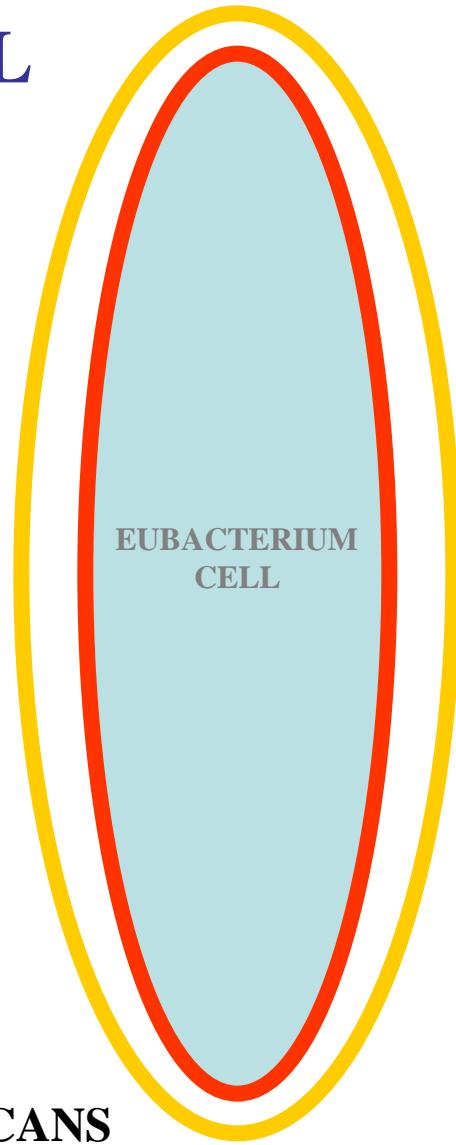
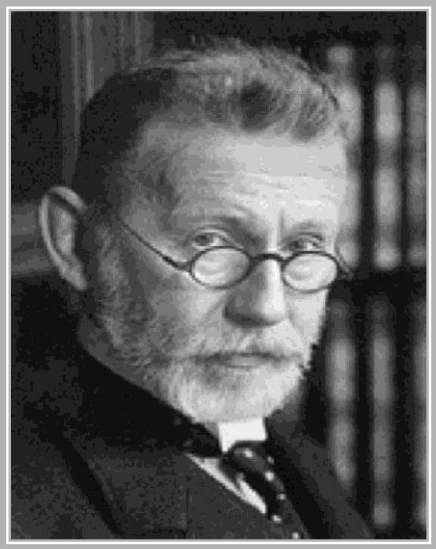
**PEPTIDOGLYCANS**  
*DO NOT TURN*  
**VIOLET**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**



# EUBACTERIUM CELL WALL

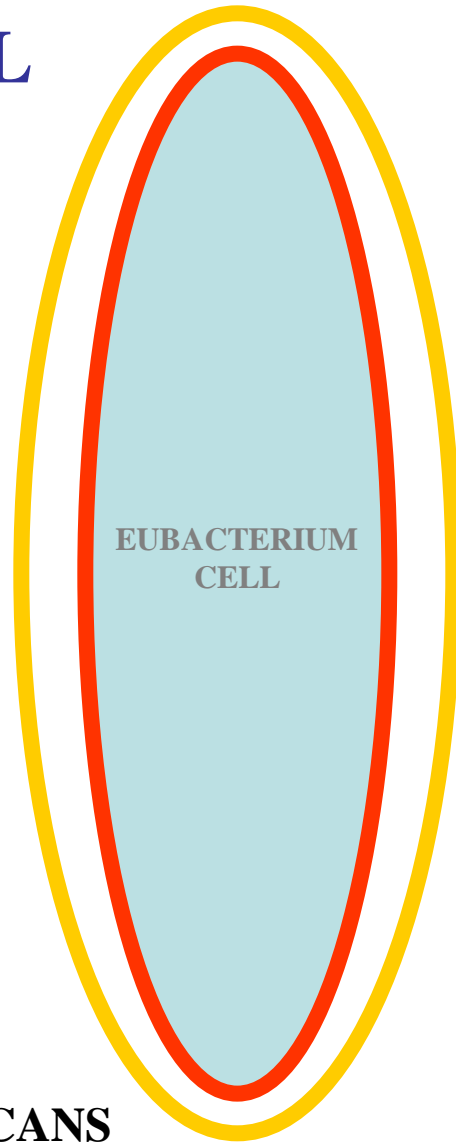
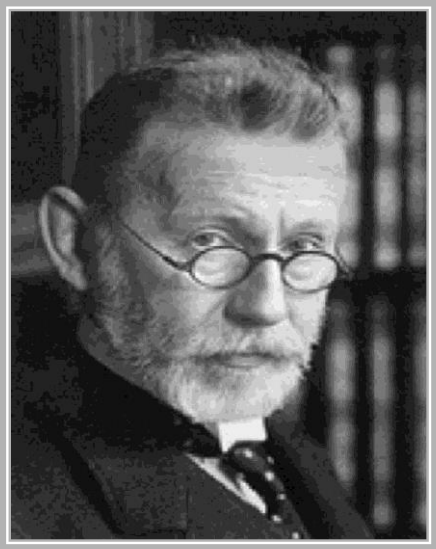


**CELL WALL  
DOES NOT TURN  
VIOLET**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

# EUBACTERIUM CELL WALL



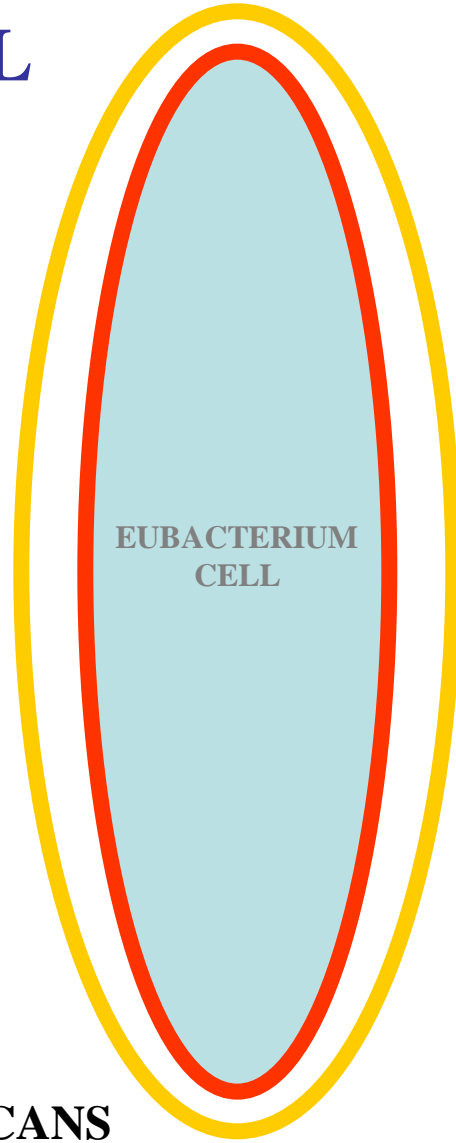
?

**EUBACTERIUM**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**


# EUBACTERIUM CELL WALL



**GRAM -  
EUBACTERIUM**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**



# **GRAM STAIN TEST SUMMARY**

# EUBACTERIUM CELL WALL

EX

# GRAM STAIN TEST



EUBACTERIUM  
CELL

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL

# GRAM STAIN TEST



EUBACTERIUM  
CELL

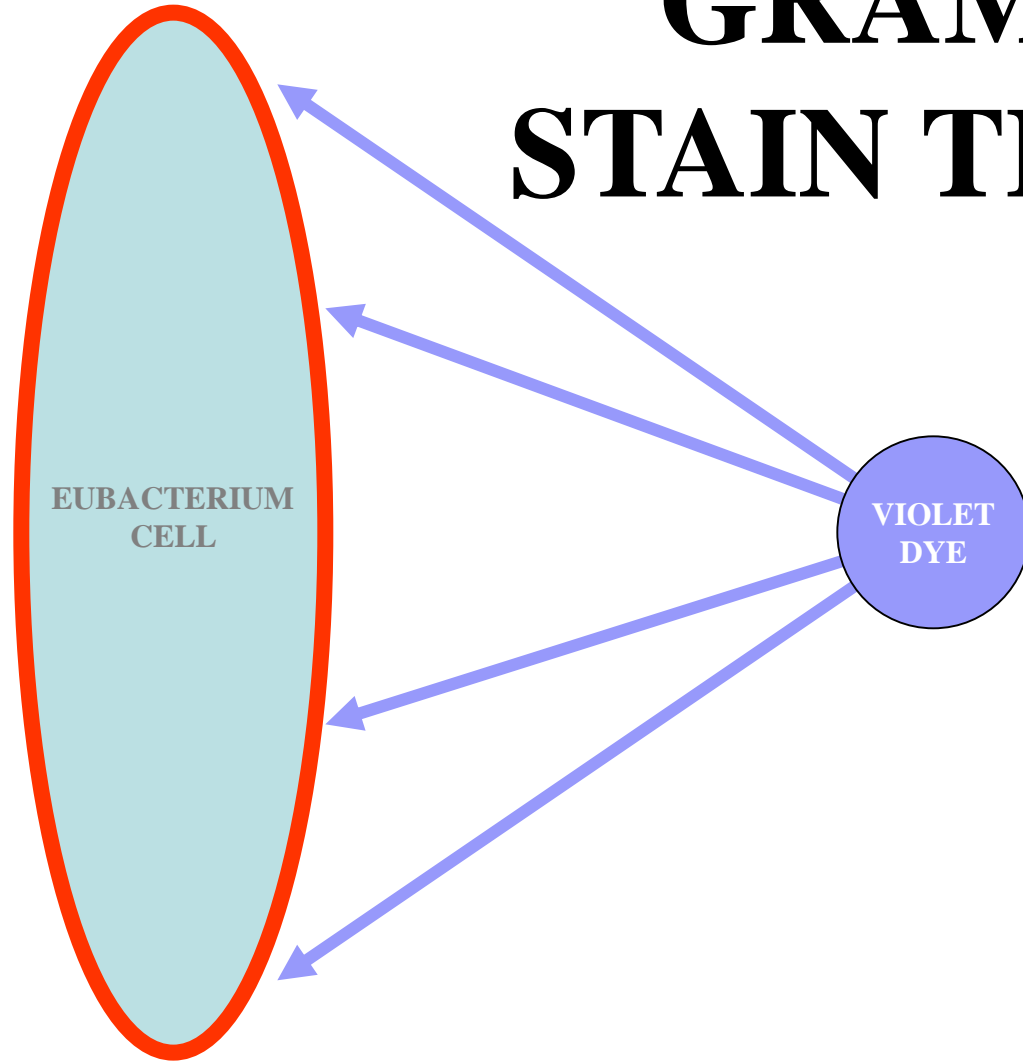
**EXPOSED  
PEPTIDOGLYCANS**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL

# GRAM STAIN TEST



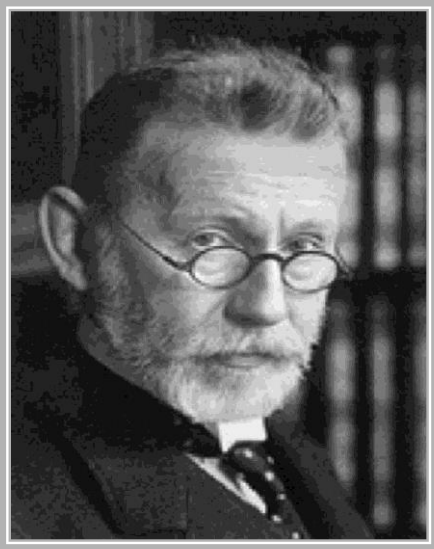
 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



# GRAM STAIN TEST



EUBACTERIUM  
CELL

**PEPTIDOGLYCANS**  
**ABSORB**  
**VIOLET DYE**

 = PEPTIDOGLYCANS

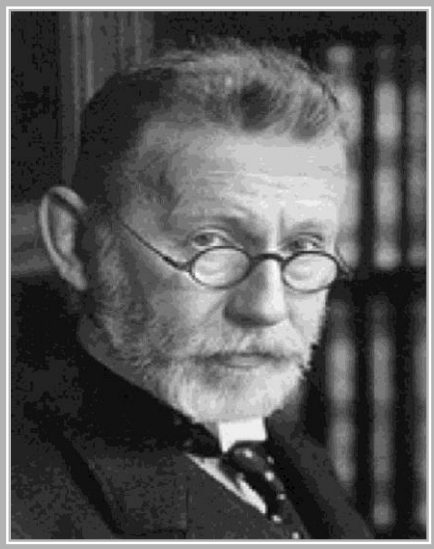
 = LIPOPOLYSACCHARIDES – **ABSENT**



# EUBACTERIUM CELL WALL



# GRAM STAIN TEST



EUBACTERIUM  
CELL

**CELL WALL  
TURNS  
VIOLET**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL



# GRAM STAIN TEST



EUBACTERIUM  
CELL

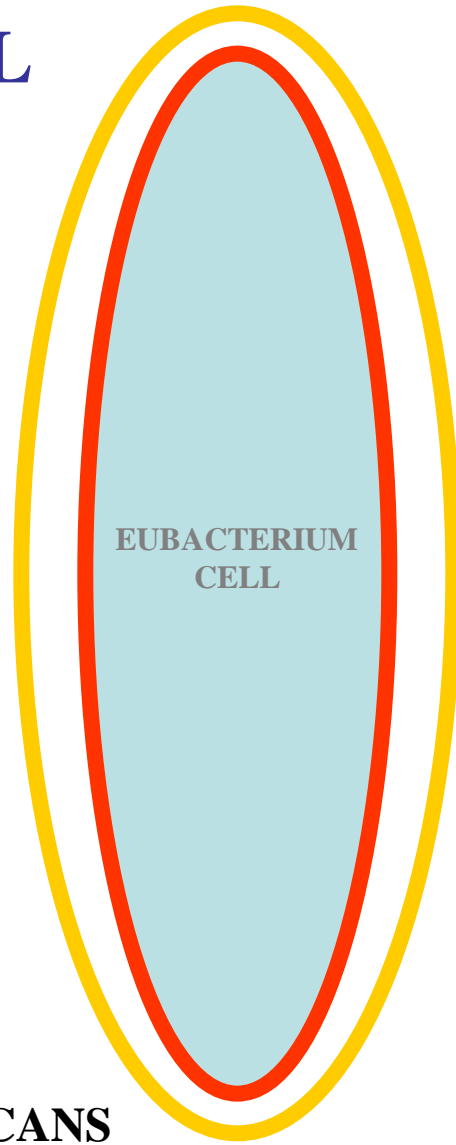
**GRAM +  
EUBACTERIUM**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **ABSENT**

# EUBACTERIUM CELL WALL

# GRAM STAIN TEST

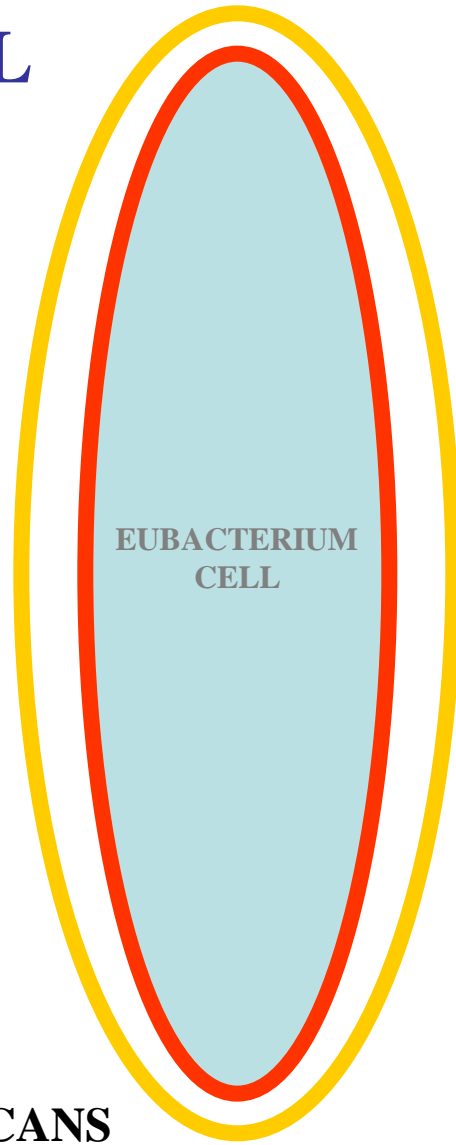


 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**

# EUBACTERIUM CELL WALL

# GRAM STAIN TEST



**NON-EXPOSED  
PEPTIDOGLYCANS**

 = PEPTIDOGLYCANS

 = LIPOPOLYSACCHARIDES – **PRESENT**