

RIBOSOME COMPOSITION



**NUCLEIC ACID
PROTEIN
COMPLEX**

**RIBOSOME
COMPOSITION**

RIBOSOME COMPOSITION

P



**RNA
PROTEIN
COMPLEX**

**RIBOSOME
COMPOSITION**

PROKARYOTE RIBOSOME COMPOSITION



3 RNAs & 54 PROTEINS

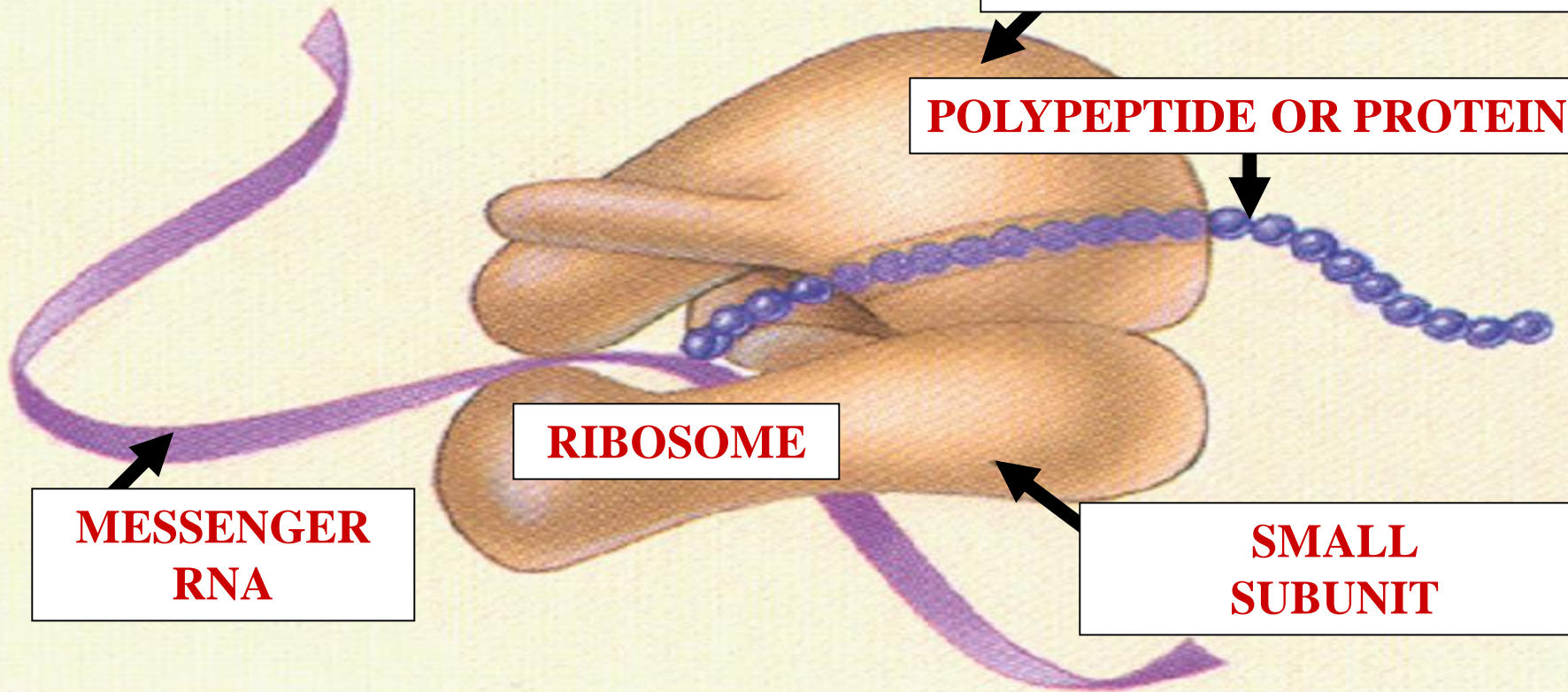
**LARGE
SUBUNIT**

POLYPEPTIDE OR PROTEIN

RIBOSOME

**MESSENGER
RNA**

**SMALL
SUBUNIT**



EUKARYOTE RIBOSOME COMPOSITION

S



4 RNAs & 73 PROTEINS

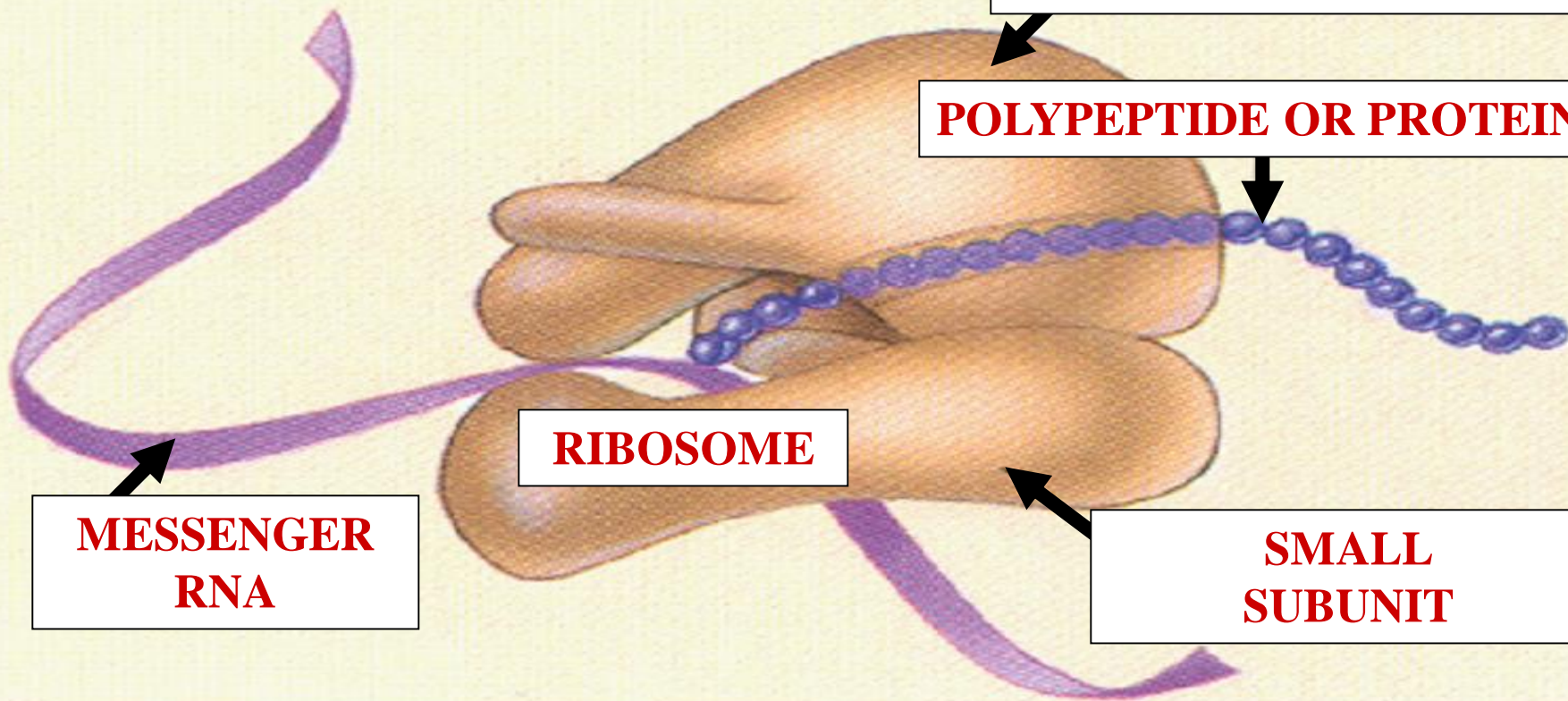
**LARGE
SUBUNIT**

POLYPEPTIDE OR PROTEIN

RIBOSOME

**MESSENGER
RNA**

**SMALL
SUBUNIT**



PROKARYOTE RIBOSOME SMALLER



3 RNAs & 54 PROTEINS

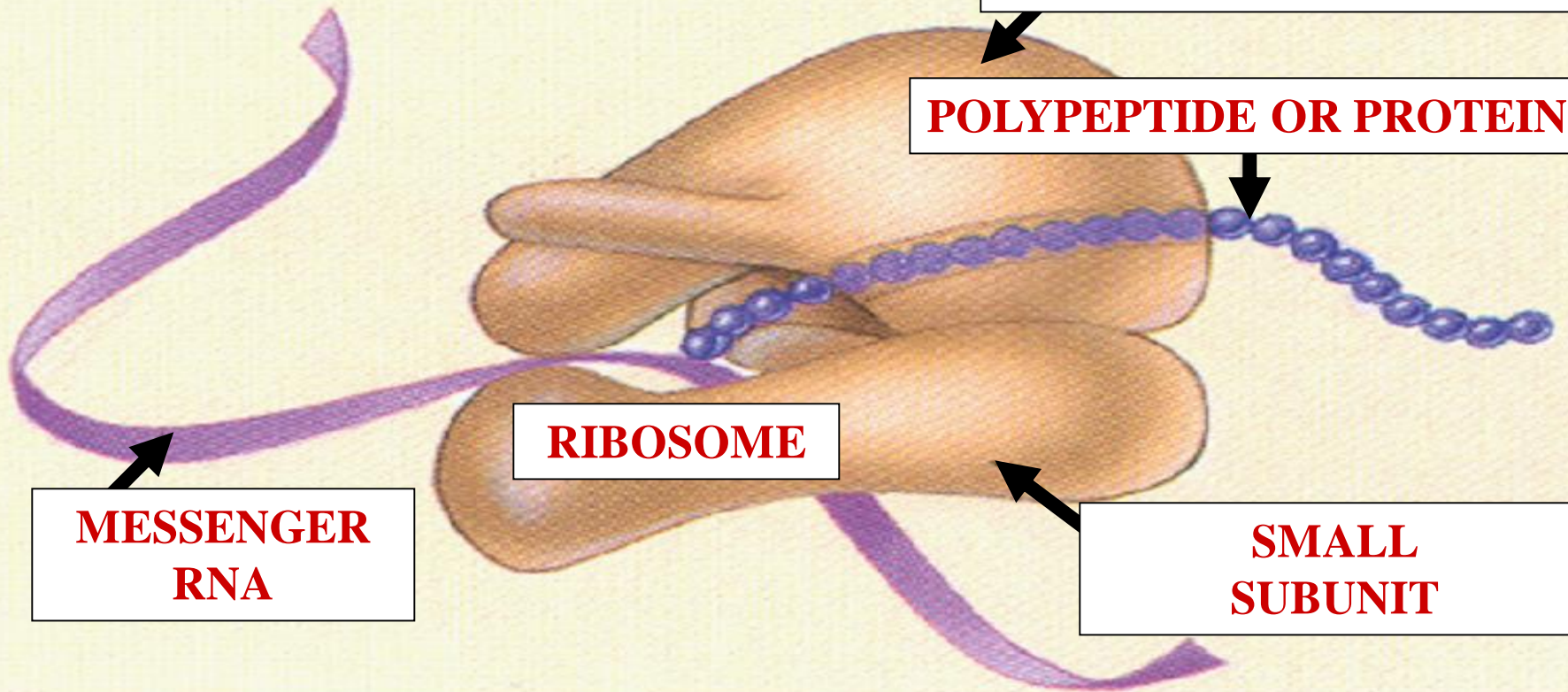
**LARGE
SUBUNIT**

POLYPEPTIDE OR PROTEIN

RIBOSOME

**MESSENGER
RNA**

**SMALL
SUBUNIT**



This electron micrograph shows several large, dark, roughly spherical ribosomes. They have a granular, textured surface and are scattered across the field of view. The background is light and mostly clear.

RIBOSOMES
SMALL SIZE

PROKARYOTES

This electron micrograph shows a large, complex eukaryotic cell. The cytoplasm is filled with numerous small, dark, spherical ribosomes. The cell contains various organelles, including a nucleus with a prominent nucleolus and a network of endoplasmic reticulum. A small grey square with a white upward-pointing arrow is located in the top right corner.

RIBOSOMES
LARGE SIZE

EUKARYOTES

NUCLEOID

NUCLEOID

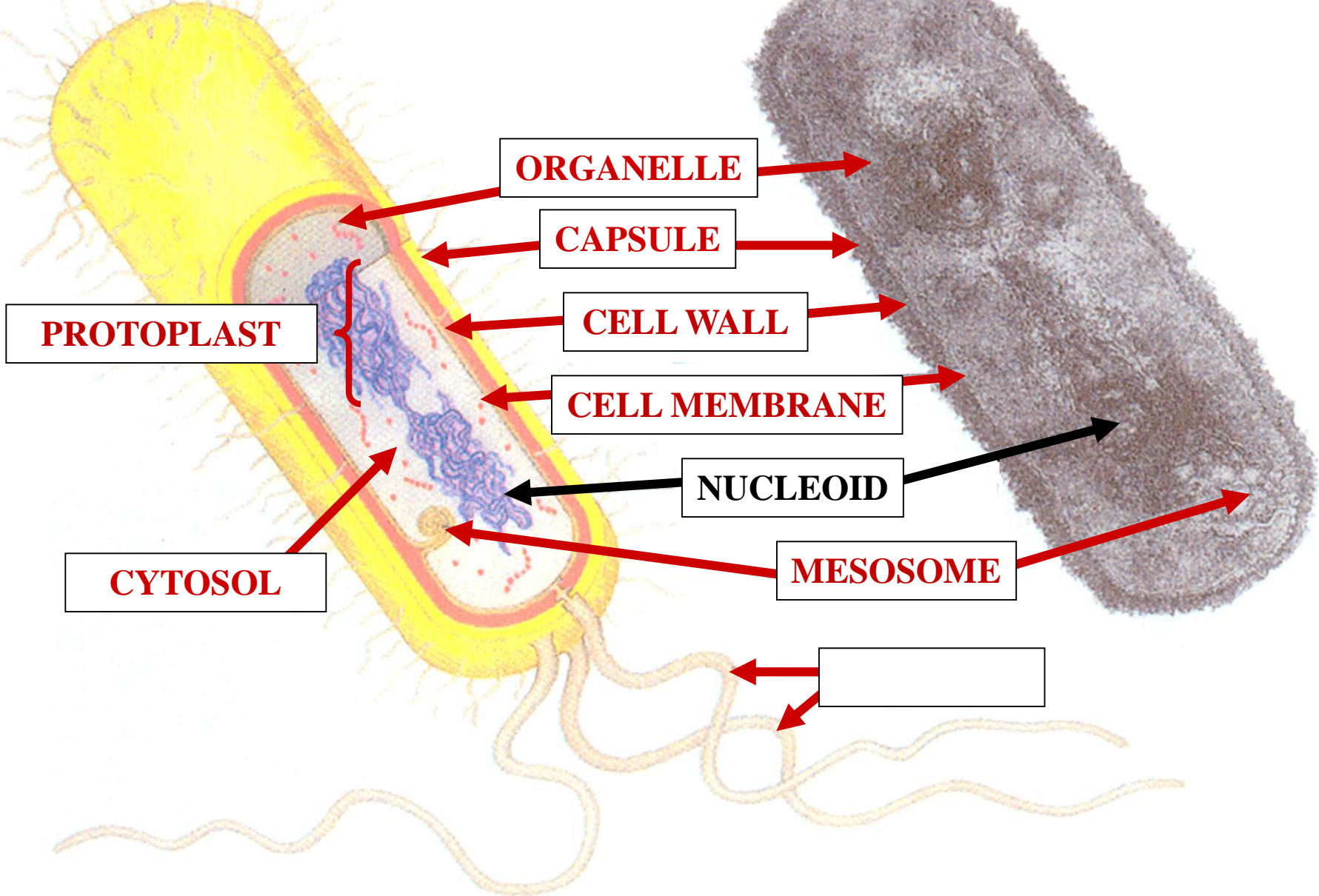


NUCLEOID

**CHROMOSOME
LOCATION**

NUCLEIOD

EUBACTERIA CYTOLOGY



PROKARYOTE EUBACTERIA CHROMOSOME

EUBACTERIA CHROMOSOME

A grayscale micrograph of several rod-shaped eubacteria cells. A large blue circle is superimposed over the center of the image, framing a white rectangular box with a black border. Inside this box, the text 'SINGLE CHROMOSOME' is written in red, bold, serif capital letters.

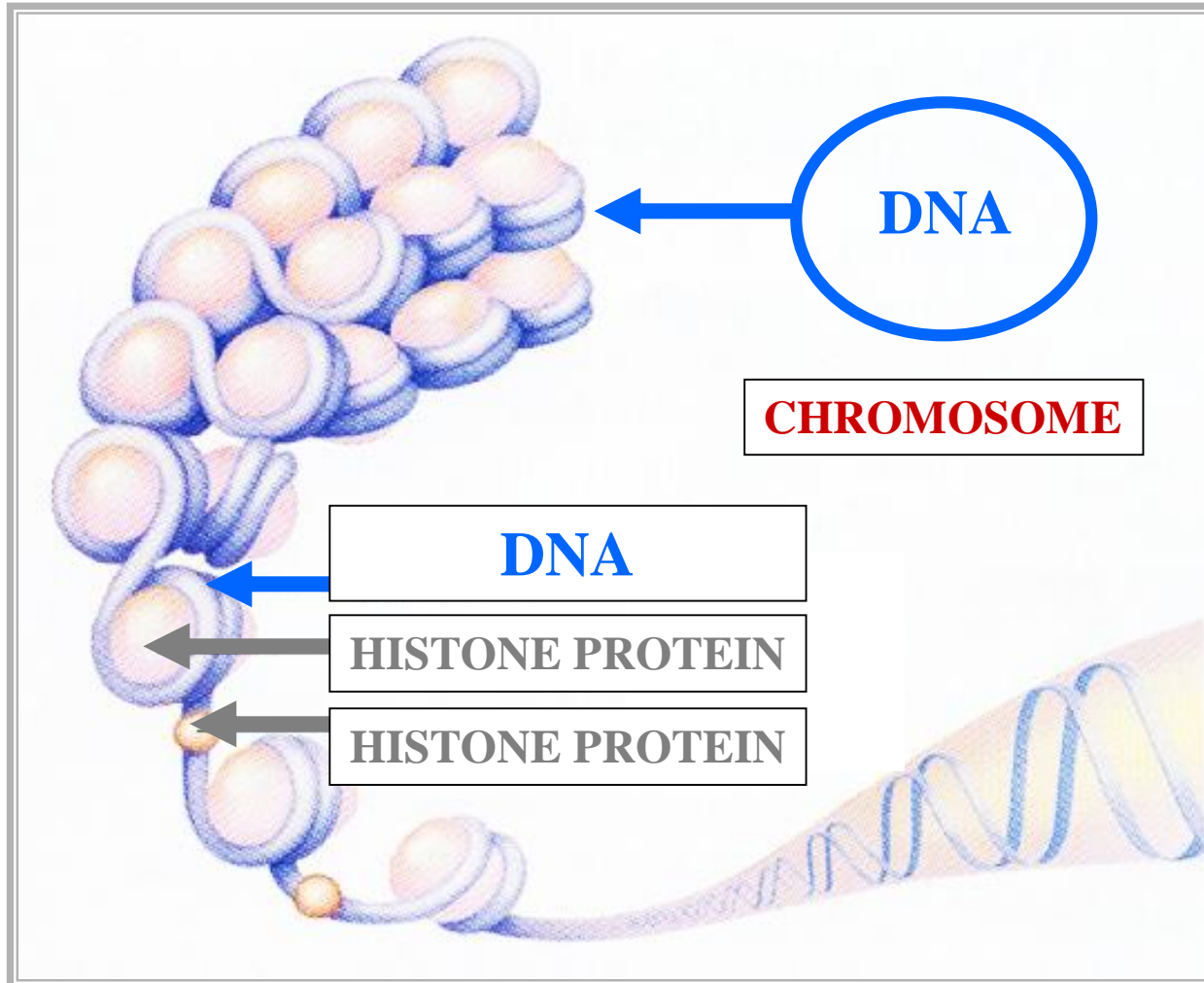
**SINGLE
CHROMOSOME**

EUBACTERIA CHROMOSOME

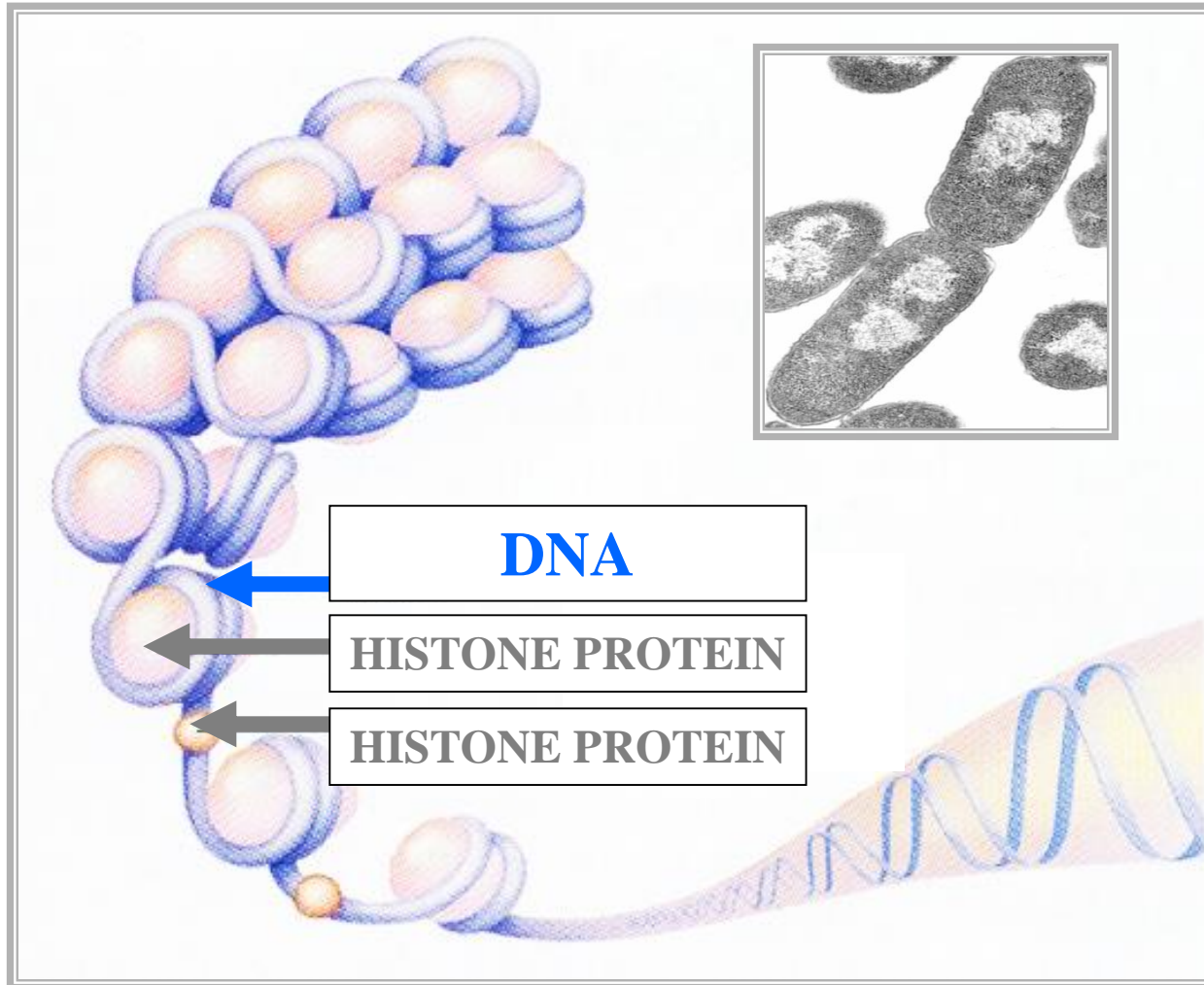
A black and white micrograph of several eubacteria cells, showing their internal structure and cell walls. A large blue circle is overlaid on the image, and inside it is a white rectangular box with a black border containing the text 'CIRCULAR DNA MOLECULE'.

**CIRCULAR
DNA
MOLECULE**

EUBACTERIA CHROMOSOME

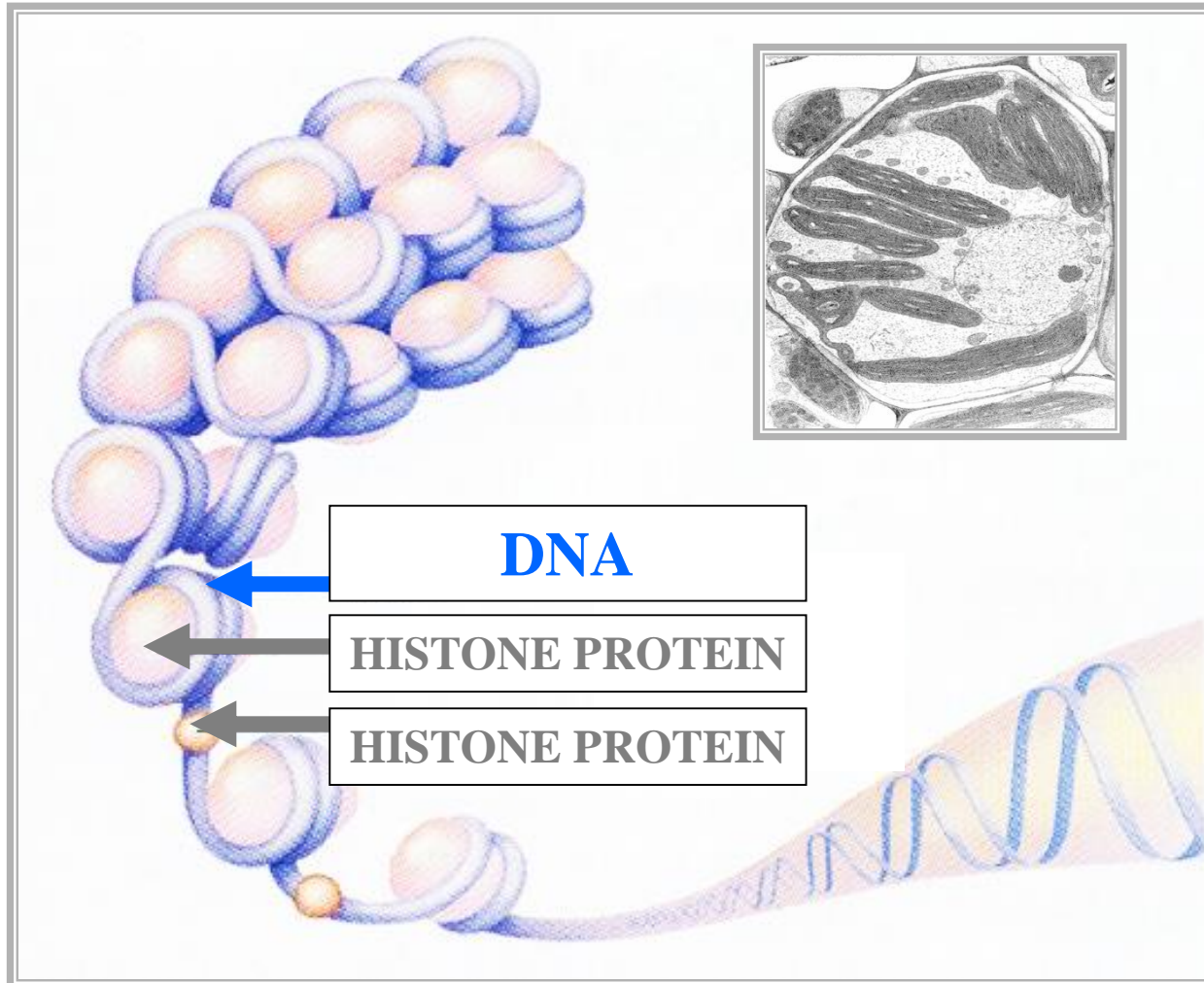


EUBACTERIA CHROMOSOME



PROKARYOTE CHROMOSOME: HISTONE PROTEINS ABSENT

EUKARYOTE CHROMOSOME



EUKARYOTE CHROMOSOME: HISTONE PROTEINS PRESENT

HISTONE PROTEINS

HISTONE PROTEINS

EUKARYOTE

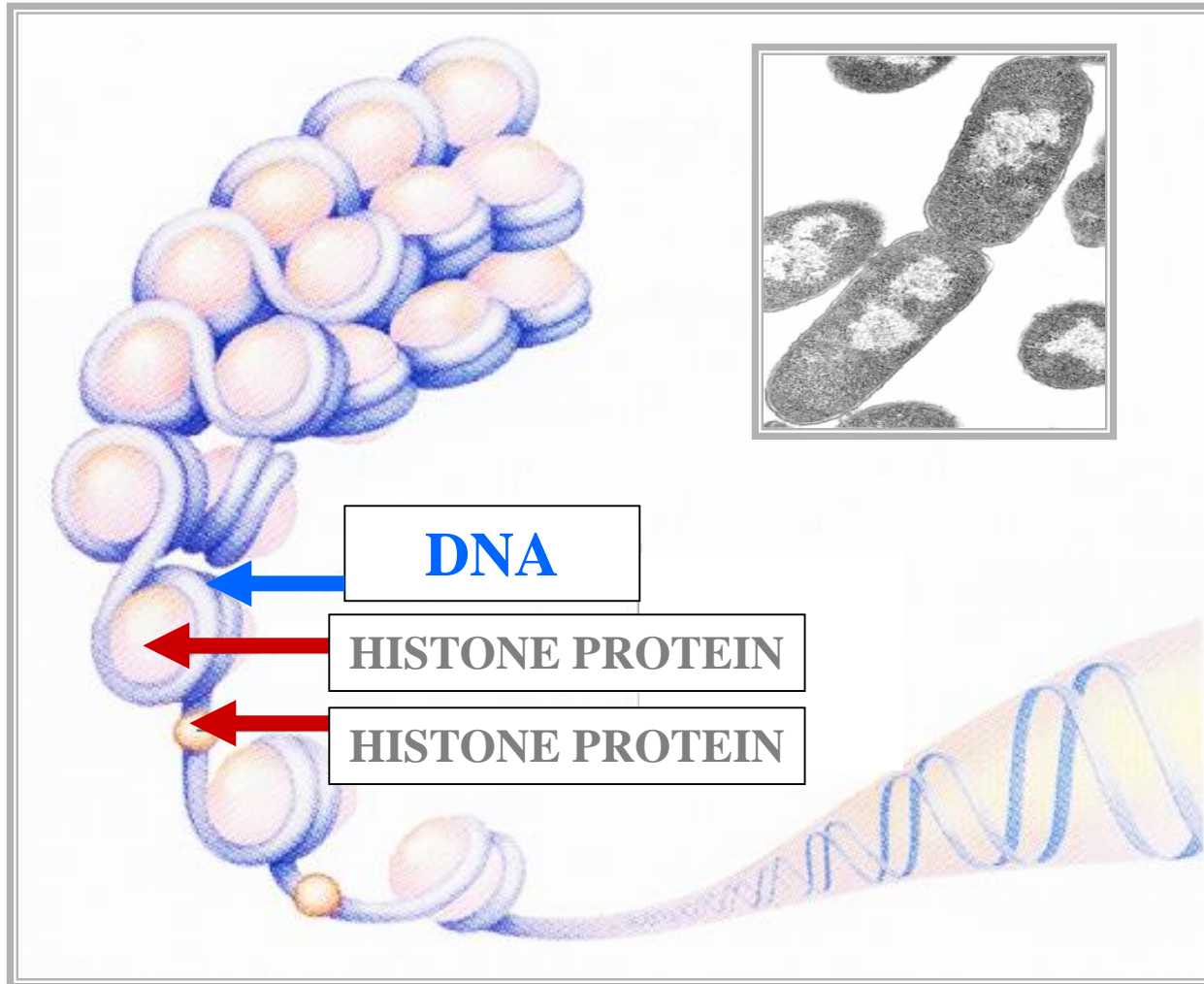
CHROMOSOME PROTEINS

DNA

SUPPORT PROTEINS

HISTONE PROTEINS

EUBACTERIA CHROMOSOME

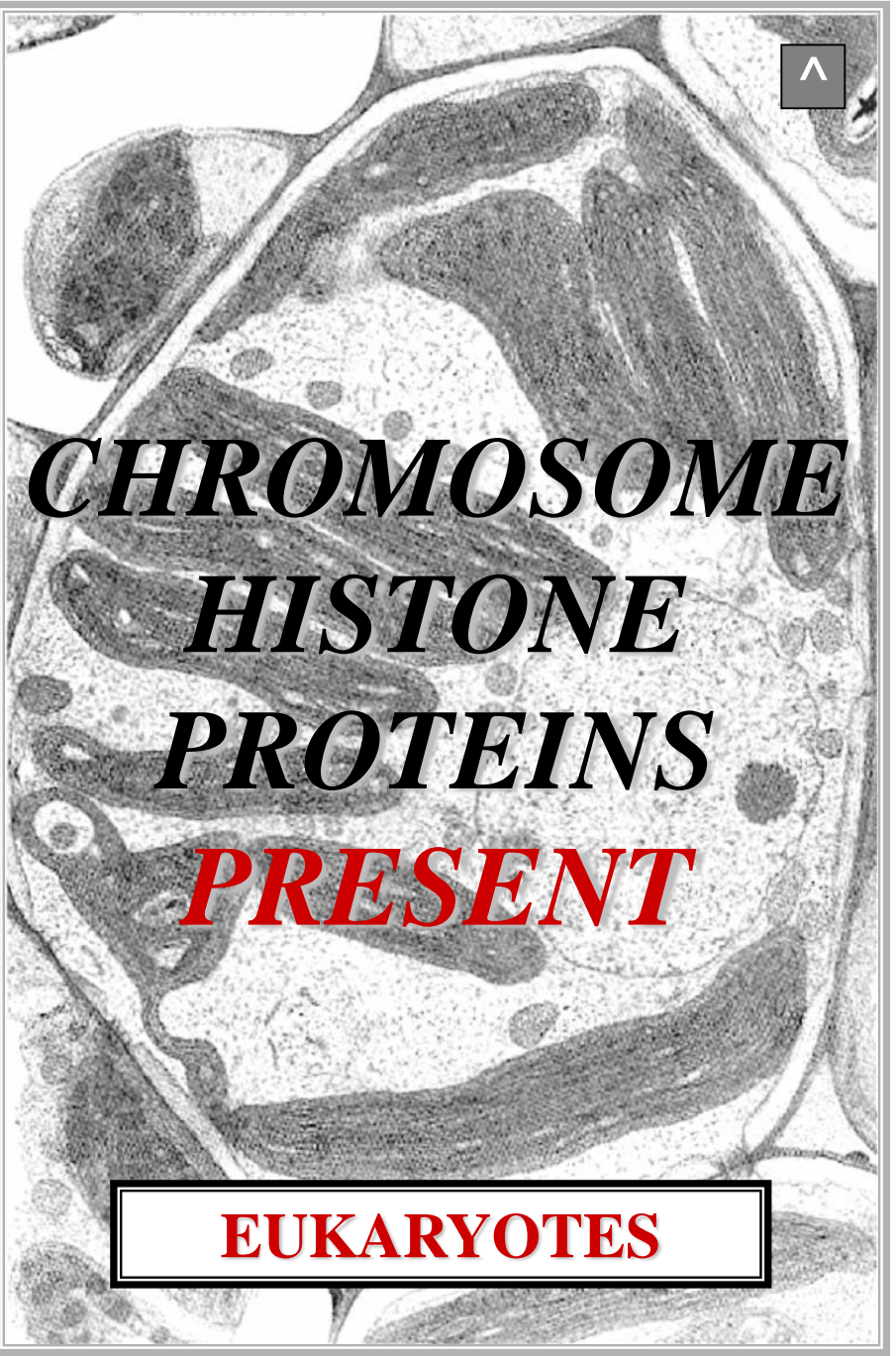


PROKARYOTE CHROMOSOME: HISTONE PROTEINS ABSENT



CHROMOSOME
HISTONE
PROTEINS
ABSENT

PROKARYOTES



CHROMOSOME
HISTONE
PROTEINS
PRESENT

EUKARYOTES

FLAGELLUM

FLAGELLUM



FLAGELLUM

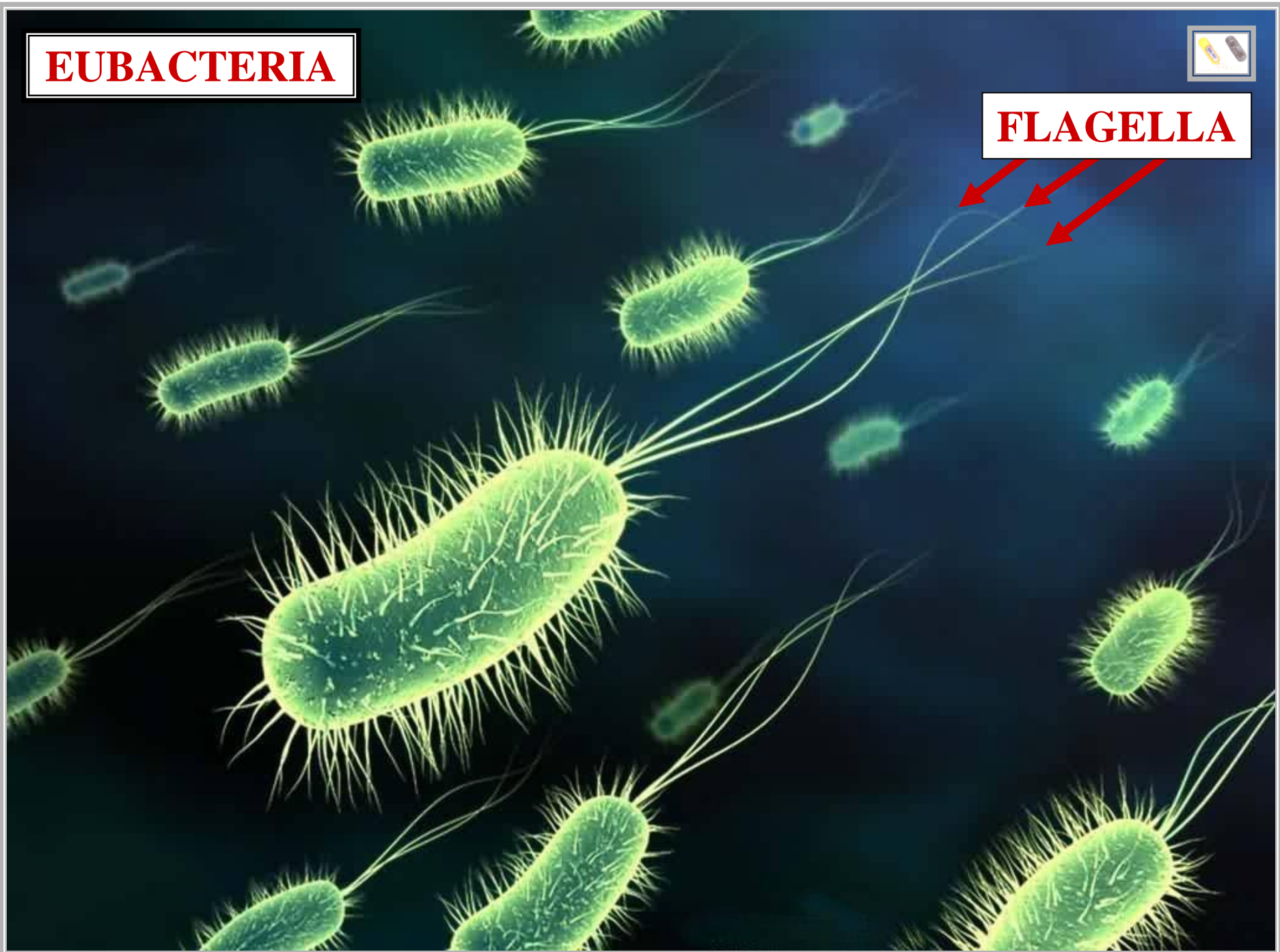
PROPULSION APPENDAGE

FLAGELLUM

EUBACTERIA

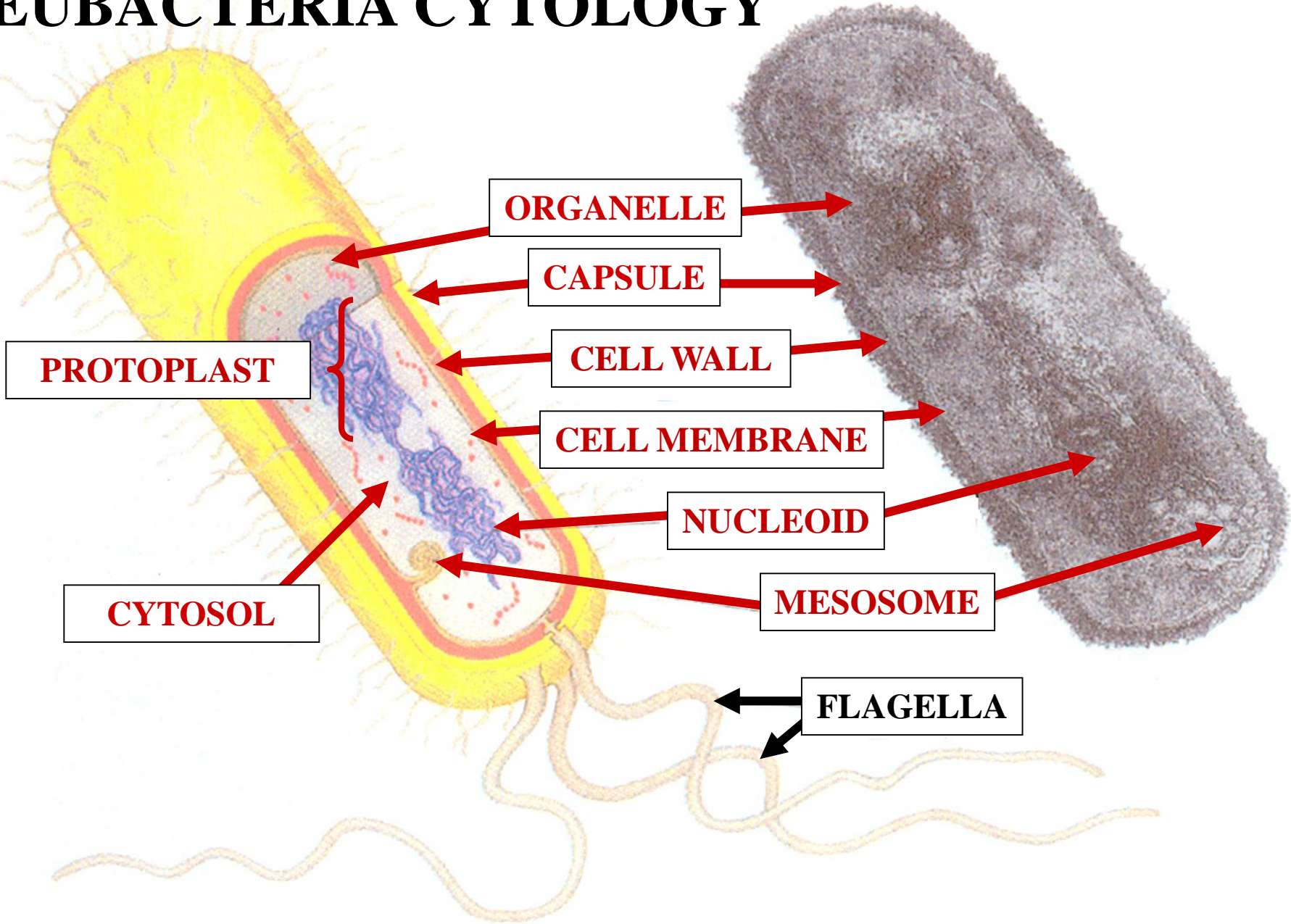


FLAGELLA

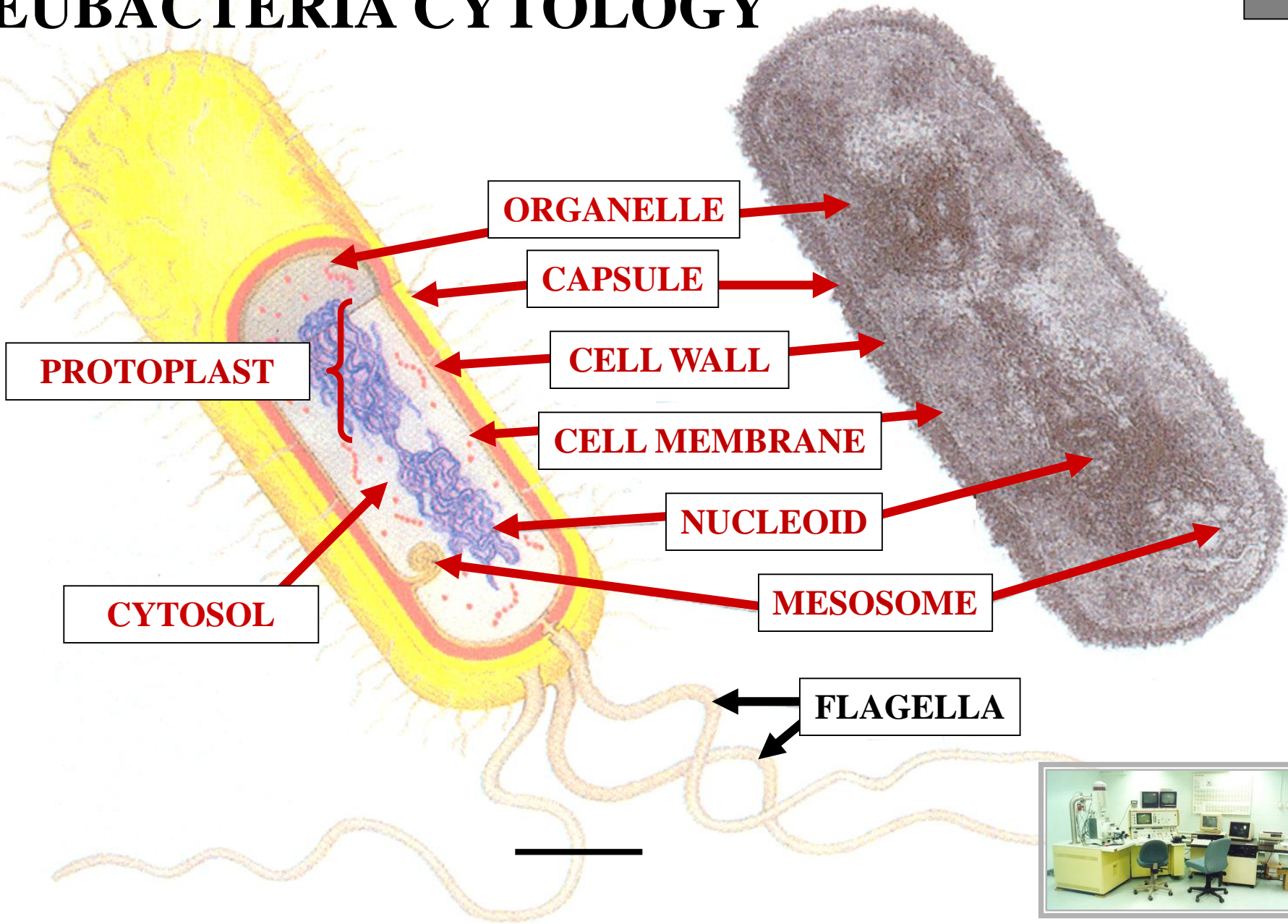


EUBACTERIA CYTOLOGY

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EUBACTERIA CYTOLOGY





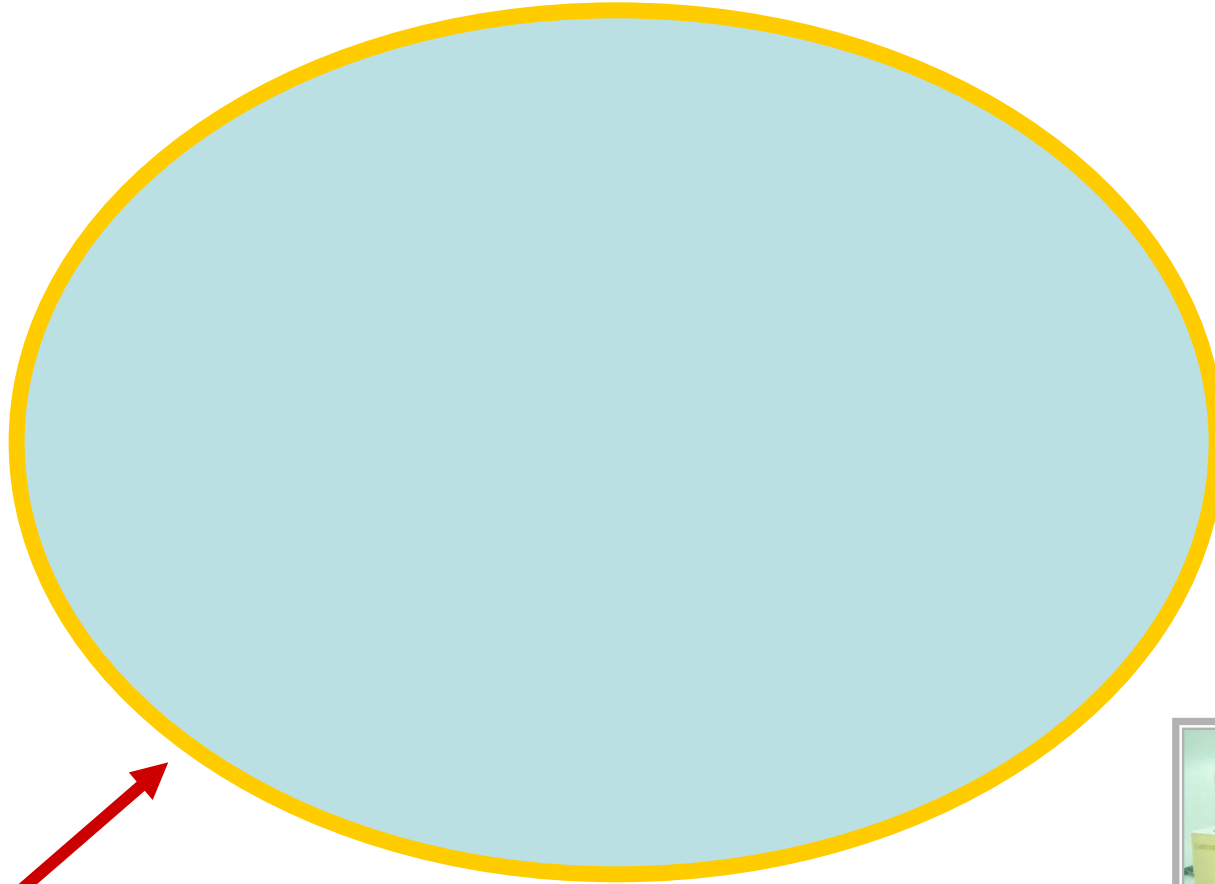
PROKARYOTE

EUBACTERIA

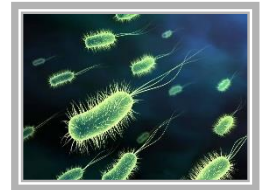
FLAGELLUM

ULTRASTRUCTURE

PROKARYOTE FLAGELLUM



MEMBRANE



C.S.

PROKARYOTE FLAGELLUM



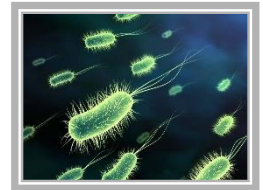
MEMBRANE: ABSENT

C.S.

PROKARYOTE FLAGELLUM

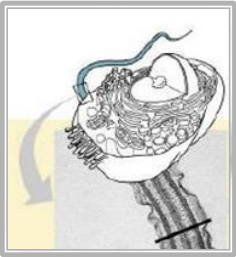


9 + 2
MICROTUBULE
PATTERN
ABSENT



MEMBRANE: ABSENT

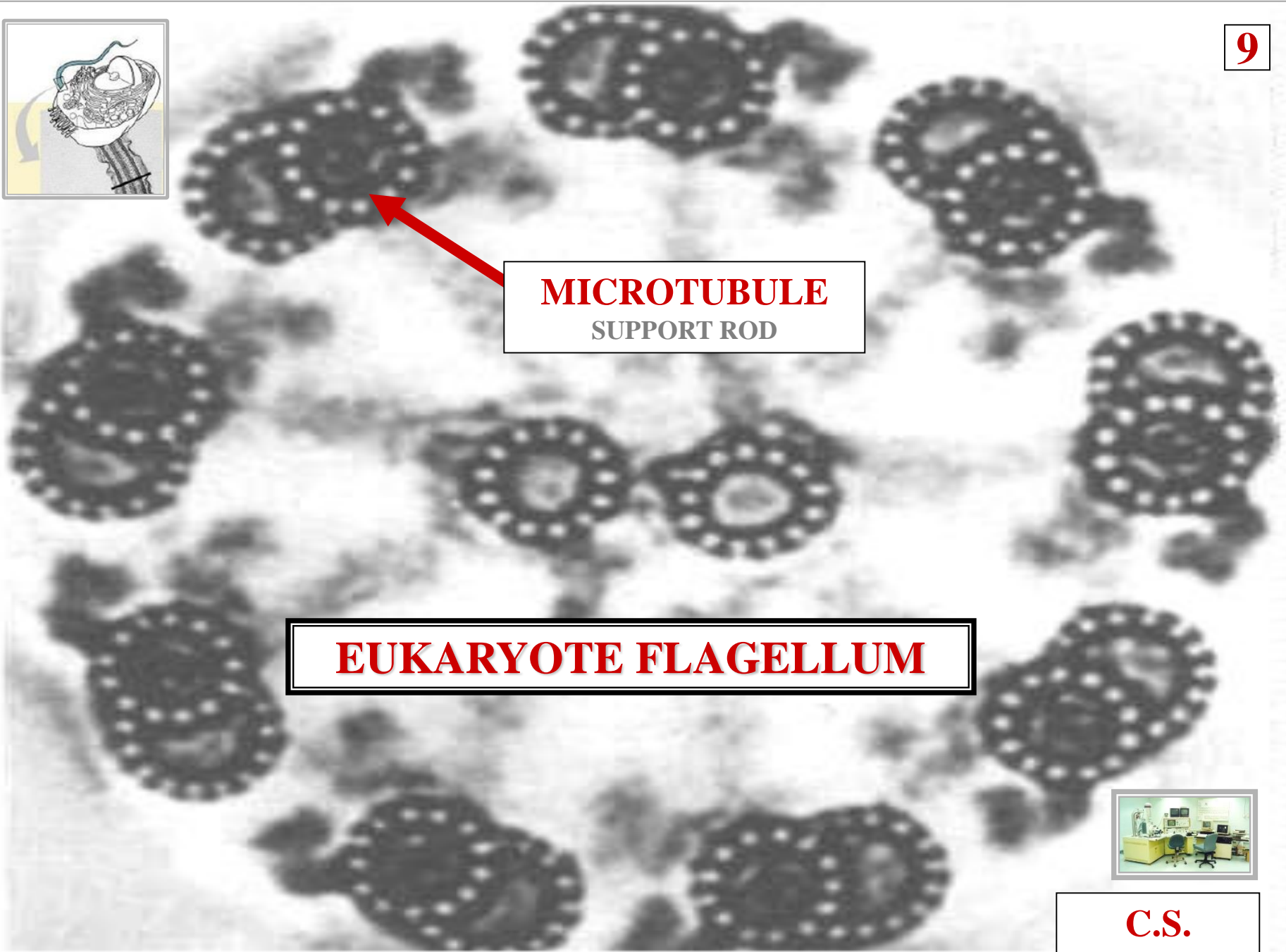
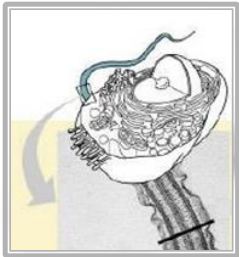
C.S.



EUKARYOTE FLAGELLUM



C.S.



**MICROTUBULE
SUPPORT ROD**

EUKARYOTE FLAGELLUM



C.S.



1

2

2

3

9 OUTER
PAIRED
MICROTUBULES

4

9

EUKARYOTE FLAGELLUM

8

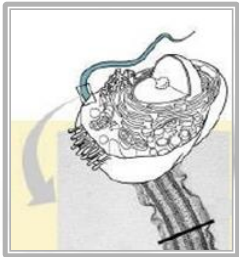
5

7

6



C.S.



**9 OUTER
PAIRED
MICROTUBULES**

**2 INNER
NON-PAIRED
MICROTUBULES**

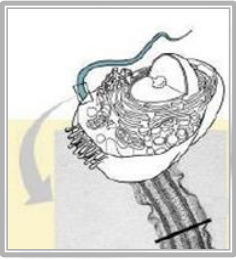
EUKARYOTE FLAGELLUM



C.S.

P

AB

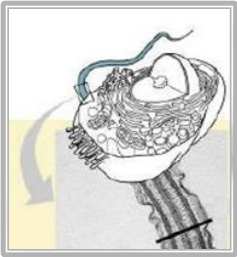


**9 OUTER
PAIRED
MICROTUBULES**

**2 INNER
NON-PAIRED
MICROTUBULES**

EUKARYOTE FLAGELLUM

9+2 MICROTUBULE PATTERN: PRESENT

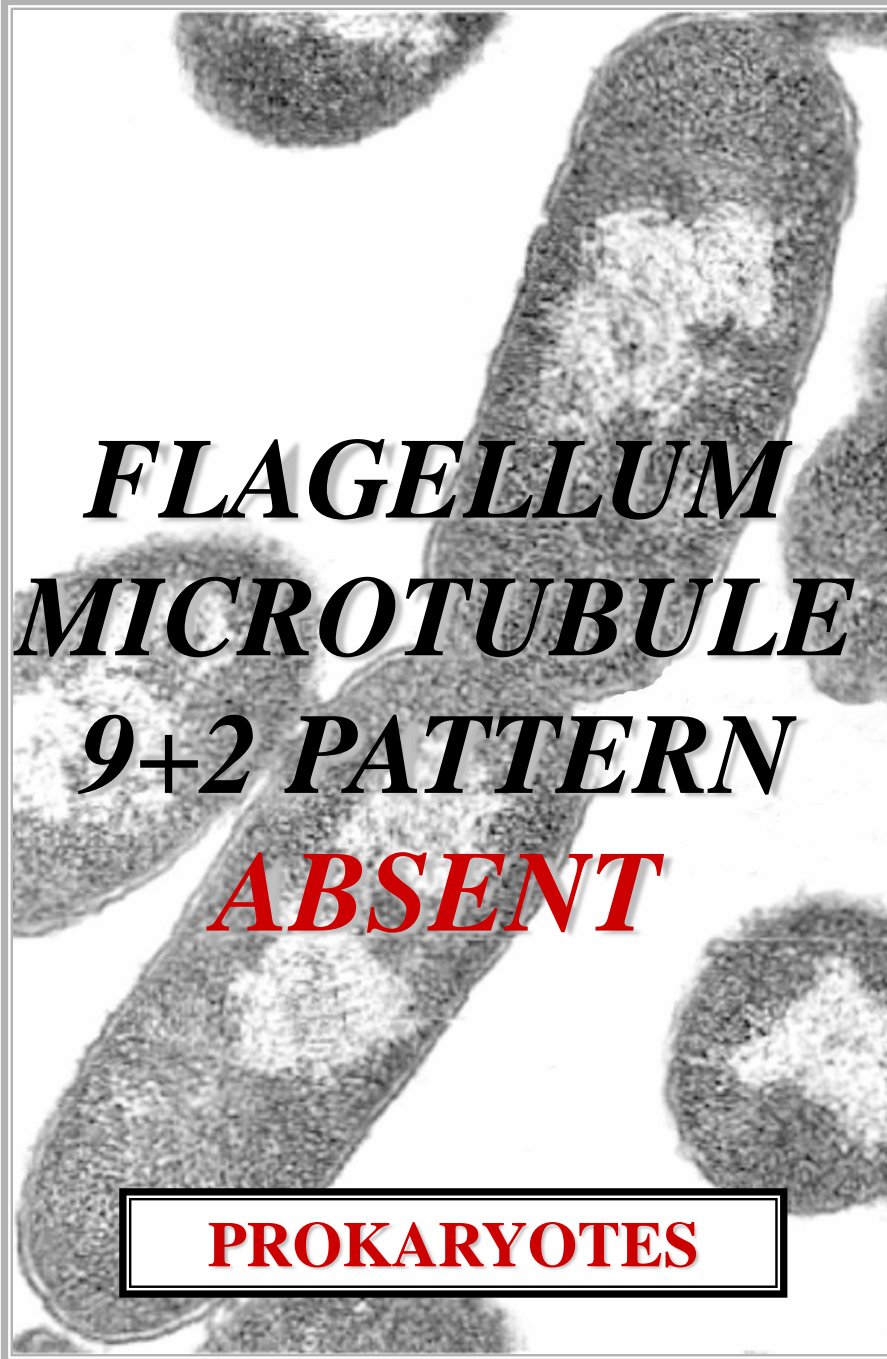


**9 OUTER
PAIRED
MICROTUBULES**

**2 INNER
NON-PAIRED
MICROTUBULES**

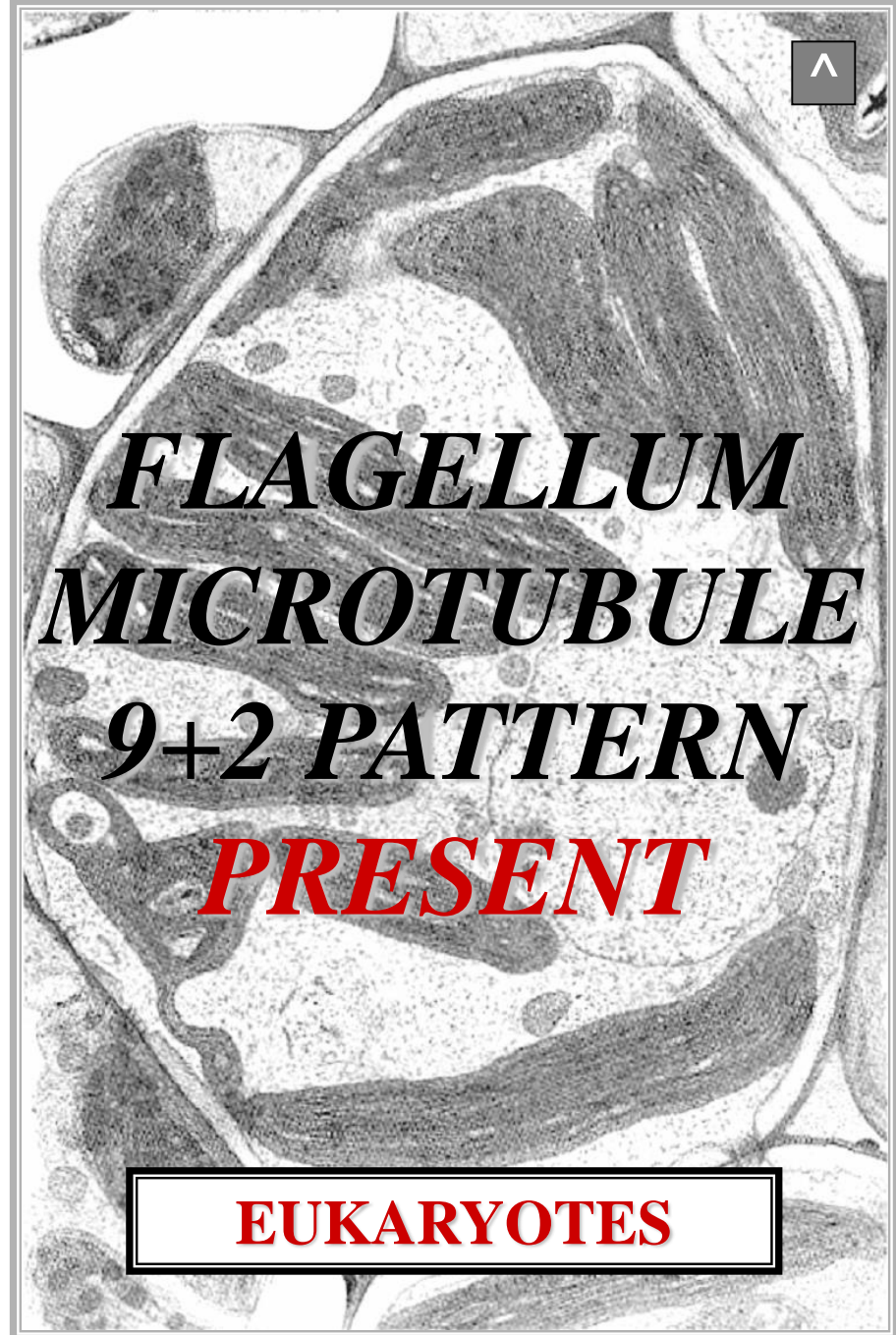
PROKARYOTE FLAGELLUM

9+2 MICROTUBULE PATTERN: ABSENT



***FLAGELLUM
MICROTUBULE
9+2 PATTERN
ABSENT***

PROKARYOTES



***FLAGELLUM
MICROTUBULE
9+2 PATTERN
PRESENT***

EUKARYOTES



PROKARYOTE

EUBACTERIA

FLAGELLUM

COMPOSITION

PROKARYOTE FLAGELLUM

FLAGELLIN



C.S.

FLAGELLIN

FLAGELLIN



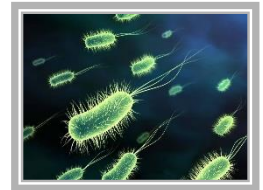
CONTRACTILE PROTEIN

FLAGELLIN

PROKARYOTE FLAGELLUM



FLAGELLIN
CONTRACTILE PROTEIN



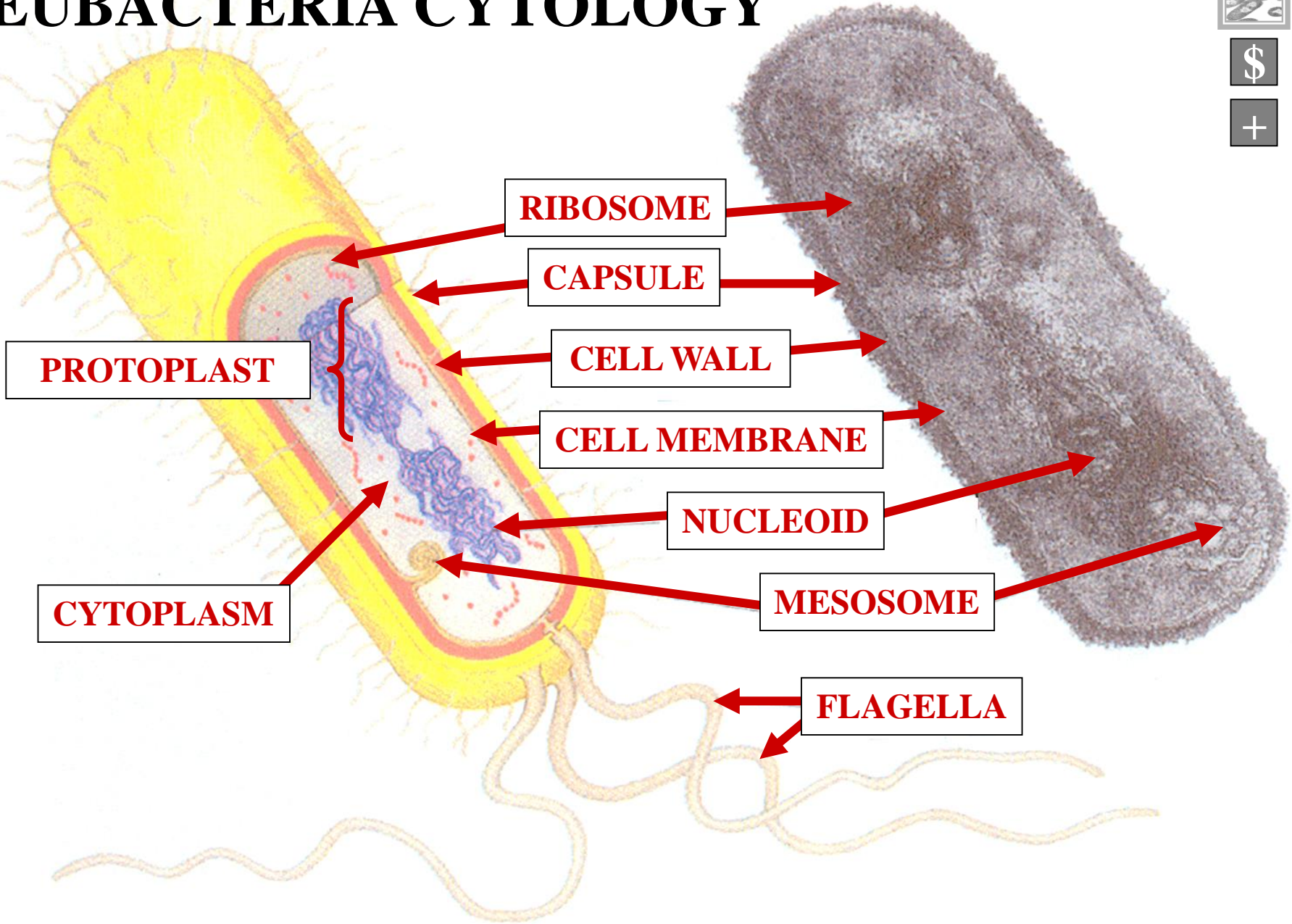
PROKARYOTE FLAGELLUM COMPOSITION: FLAGELLIN

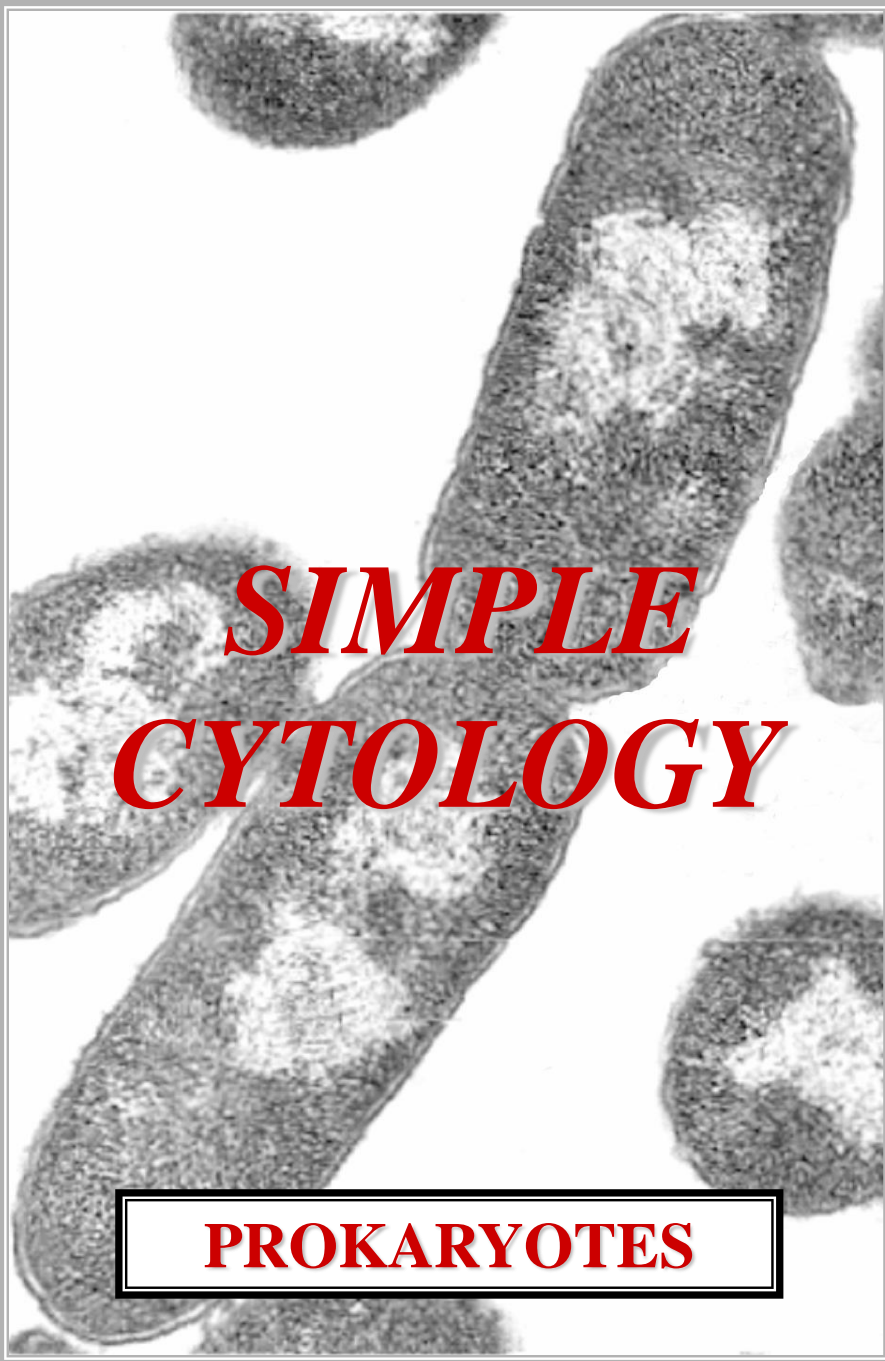
C.S.



PROKARYOTE
EUBACTERIA
CYTOLOGY
SUMMARY

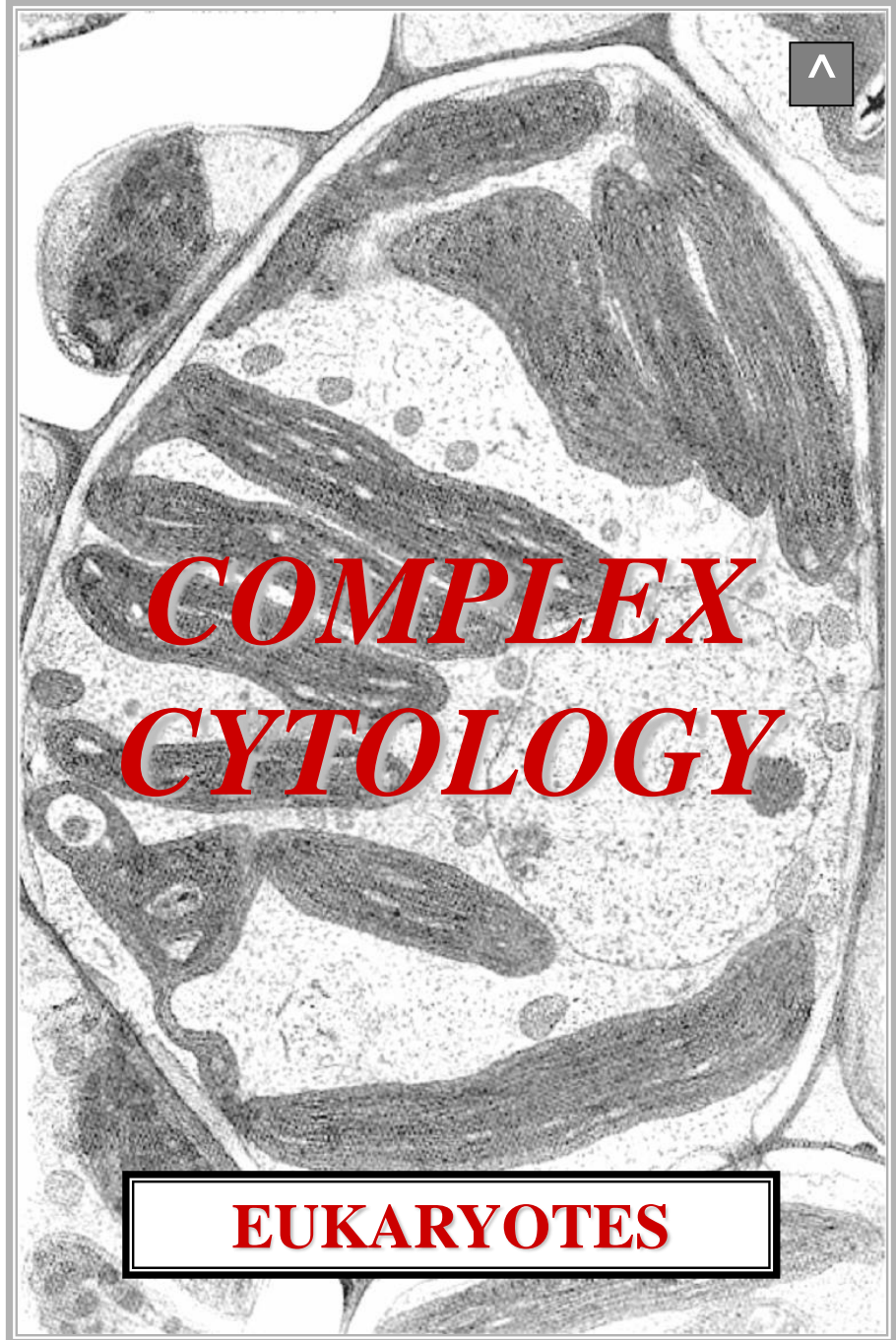
EUBACTERIA CYTOLOGY





***SIMPLE
CYTOLOGY***

PROKARYOTES



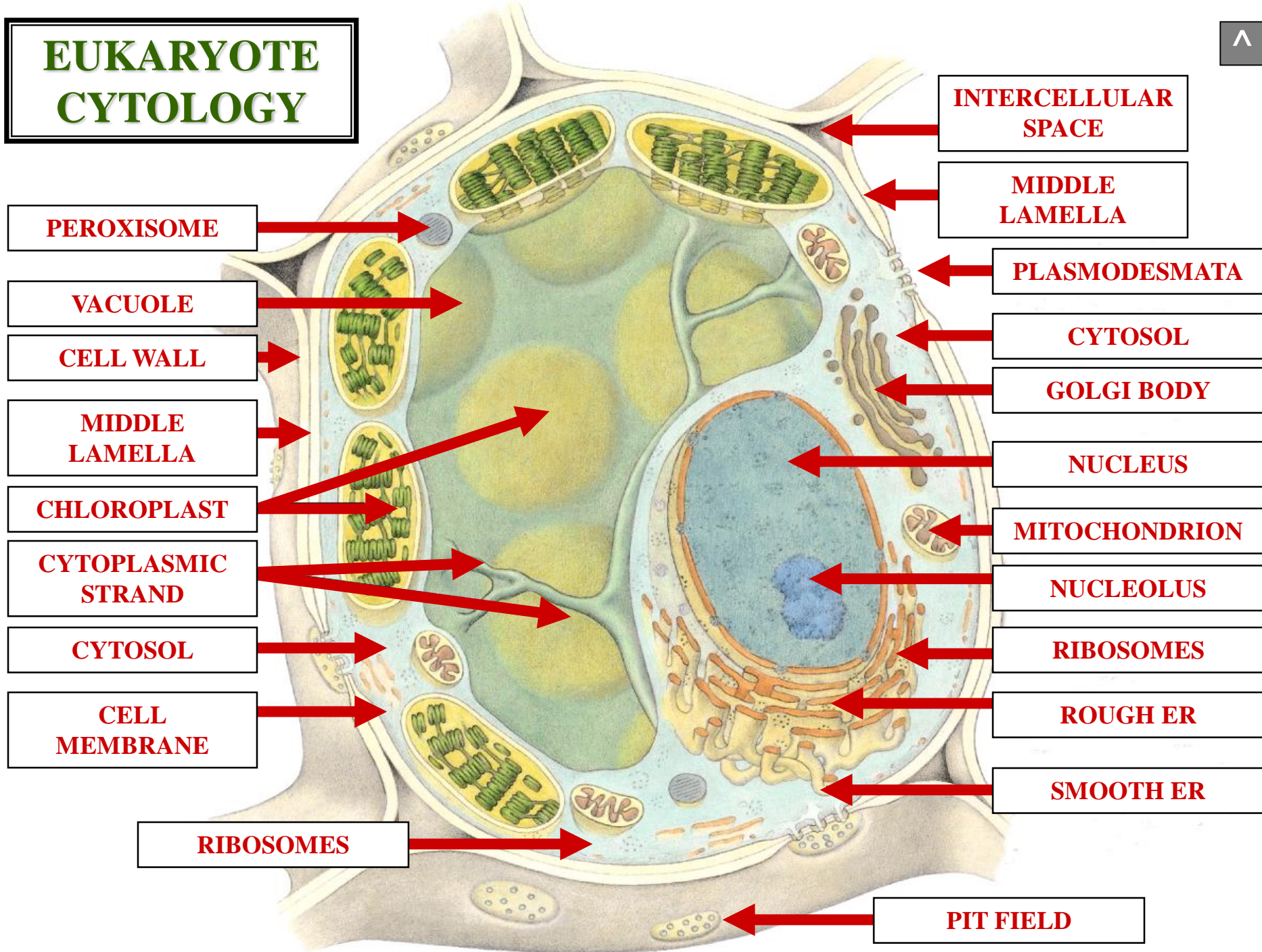
***COMPLEX
CYTOLOGY***

EUKARYOTES



EUKARYOTE CYTOLOGY

EUKARYOTE CYTOLOGY



MIDDLE LAMELLA

MIDDLE LAMELLA



MIDDLE LAMELLA

**AREA BETWEEN ADJACENT
PLANT CELLS**

MIDDLE LAMELLA



MIDDLE LAMELLA

**AREA BETWEEN ADJACENT
PLANT CELLS**

**BONDS ADJACENT
PLANT CELLS**

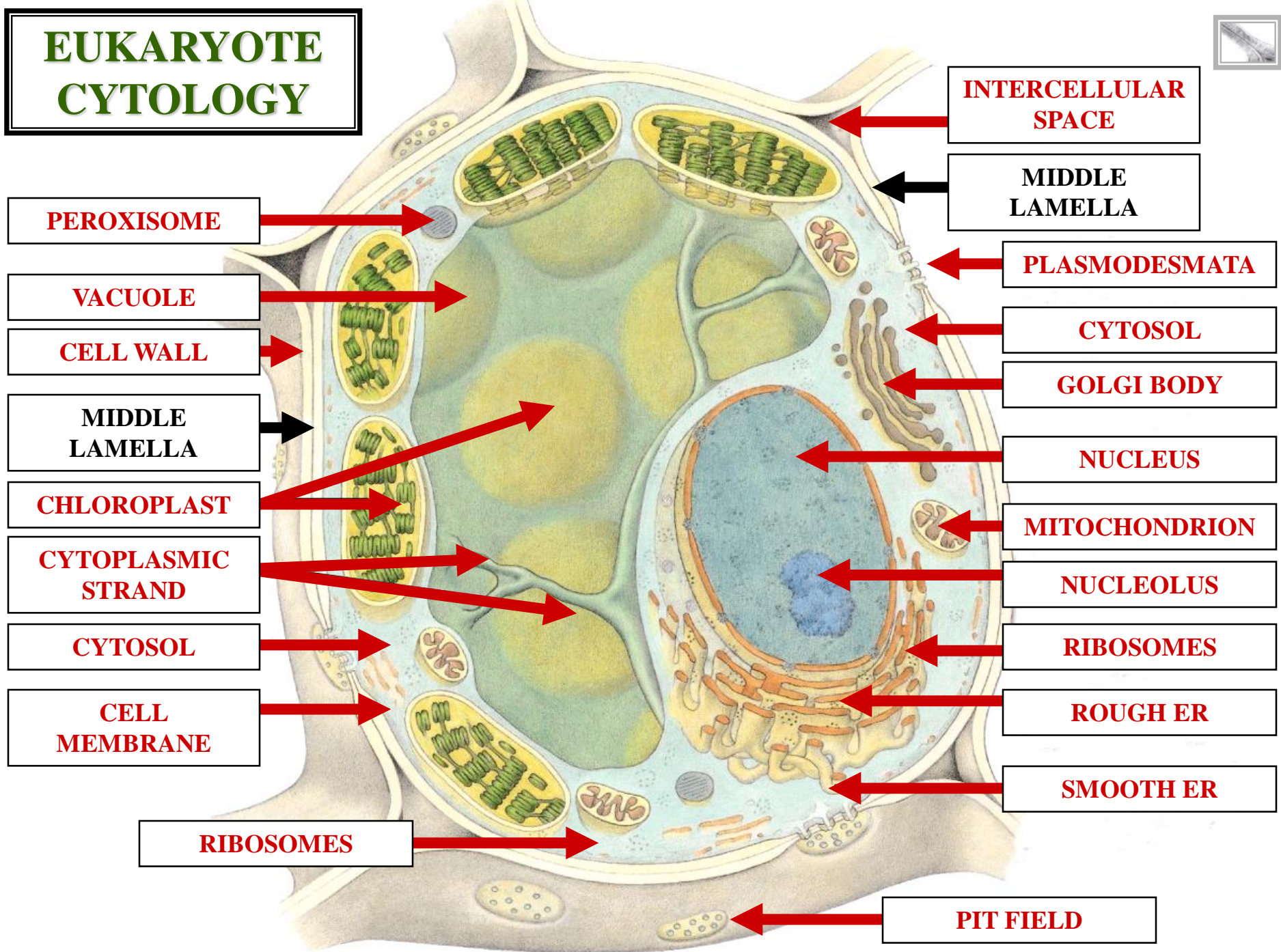
MIDDLE LAMELLA



PLANT CELLS ONLY



EUKARYOTE CYTOLOGY





CELL #2

The image shows a grayscale micrograph of a biological specimen, likely a cross-section of a plant stem or a similar structure. It features two large, elongated cells, CELL #1 and CELL #2, separated by a central structure labeled C.S. The cells exhibit a distinct layered or fibrous texture. The overall structure is curved, with CELL #1 on the left and CELL #2 on the right. The background is white, and the specimen is shown in a diagonal orientation.

C

CELL #1

C.S.

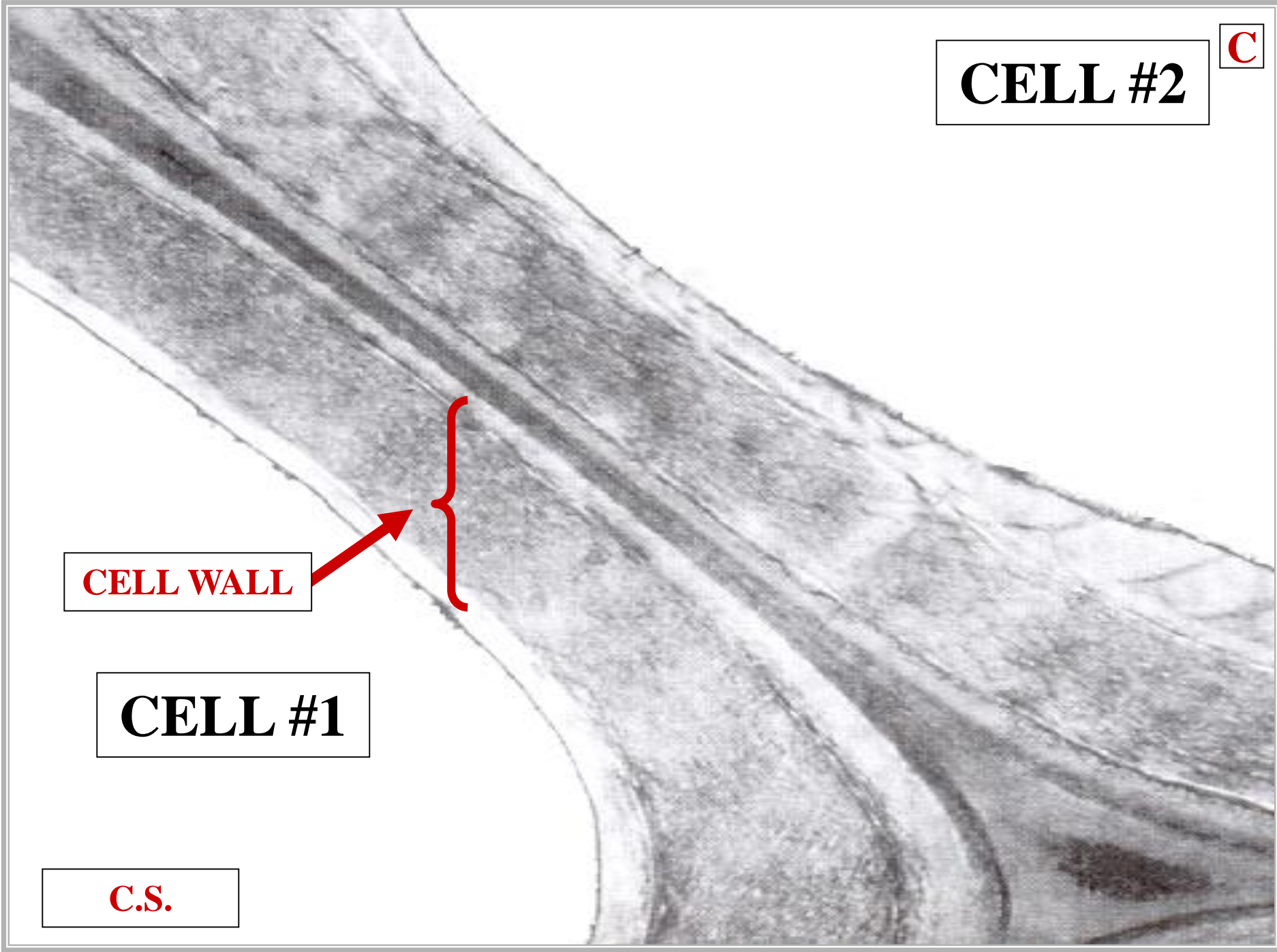
CELL #2

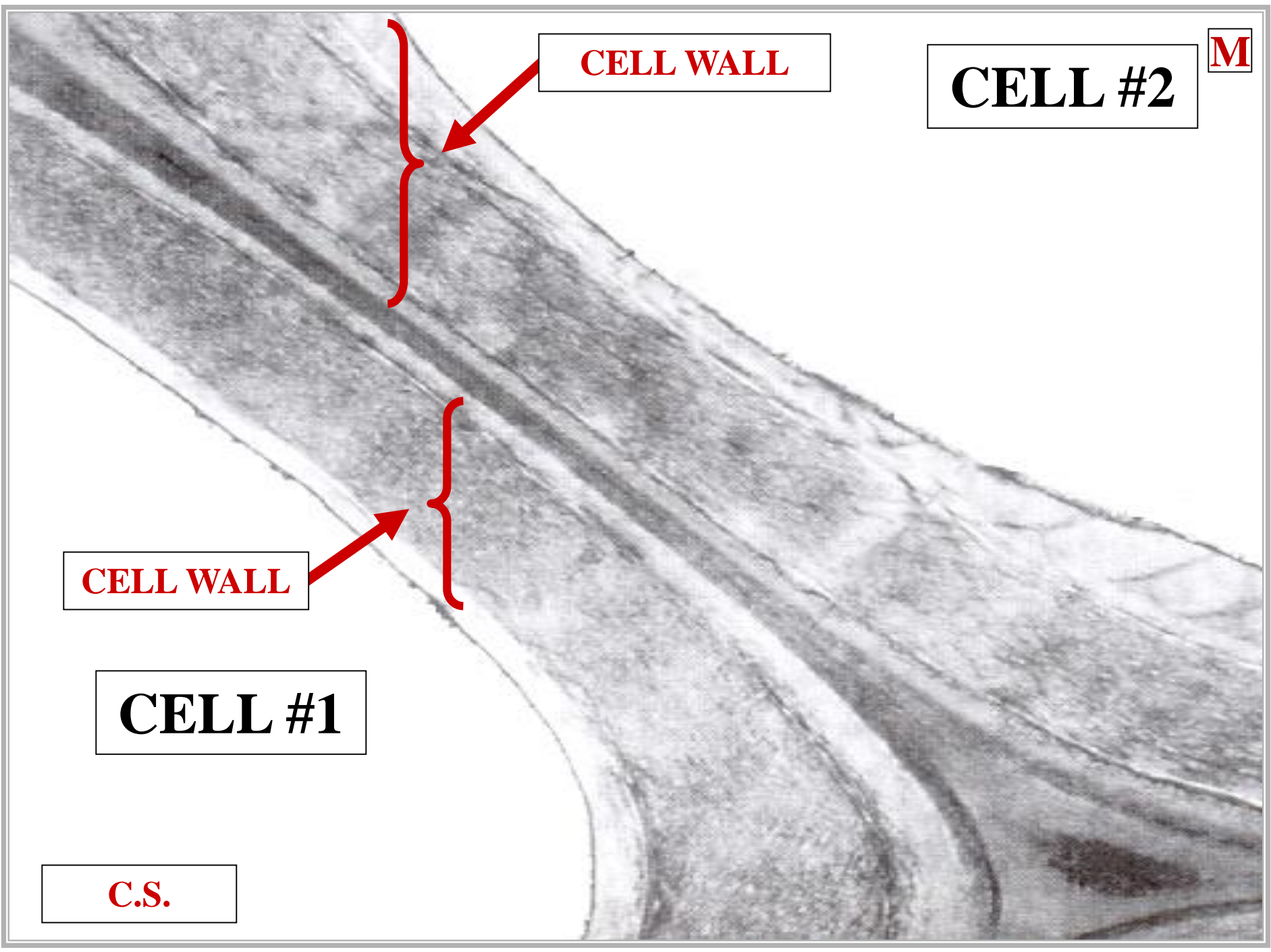
C

CELL WALL

CELL #1

C.S.





CELL WALL

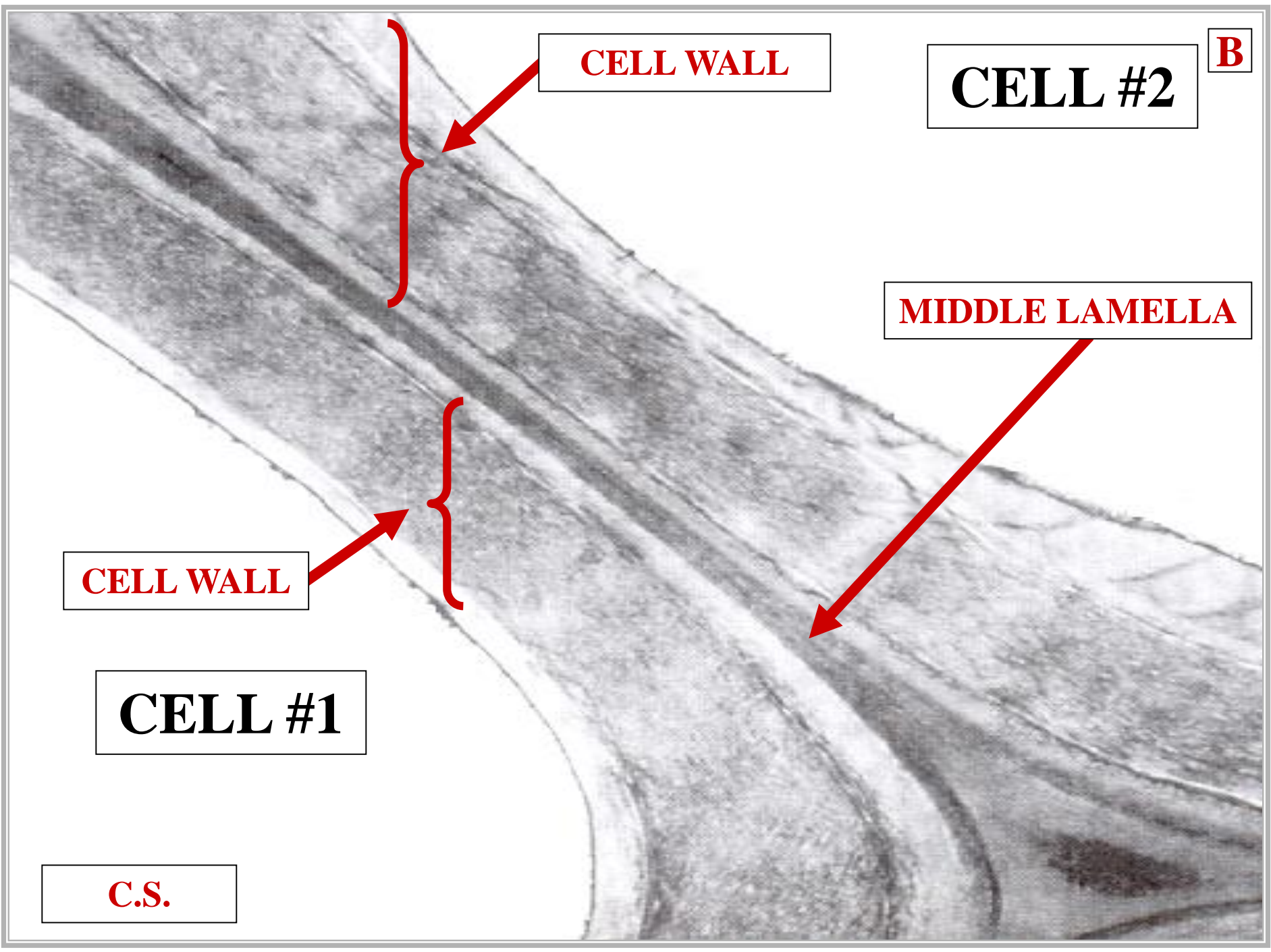
CELL #2

M

CELL WALL

CELL #1

C.S.



CELL WALL

CELL #2

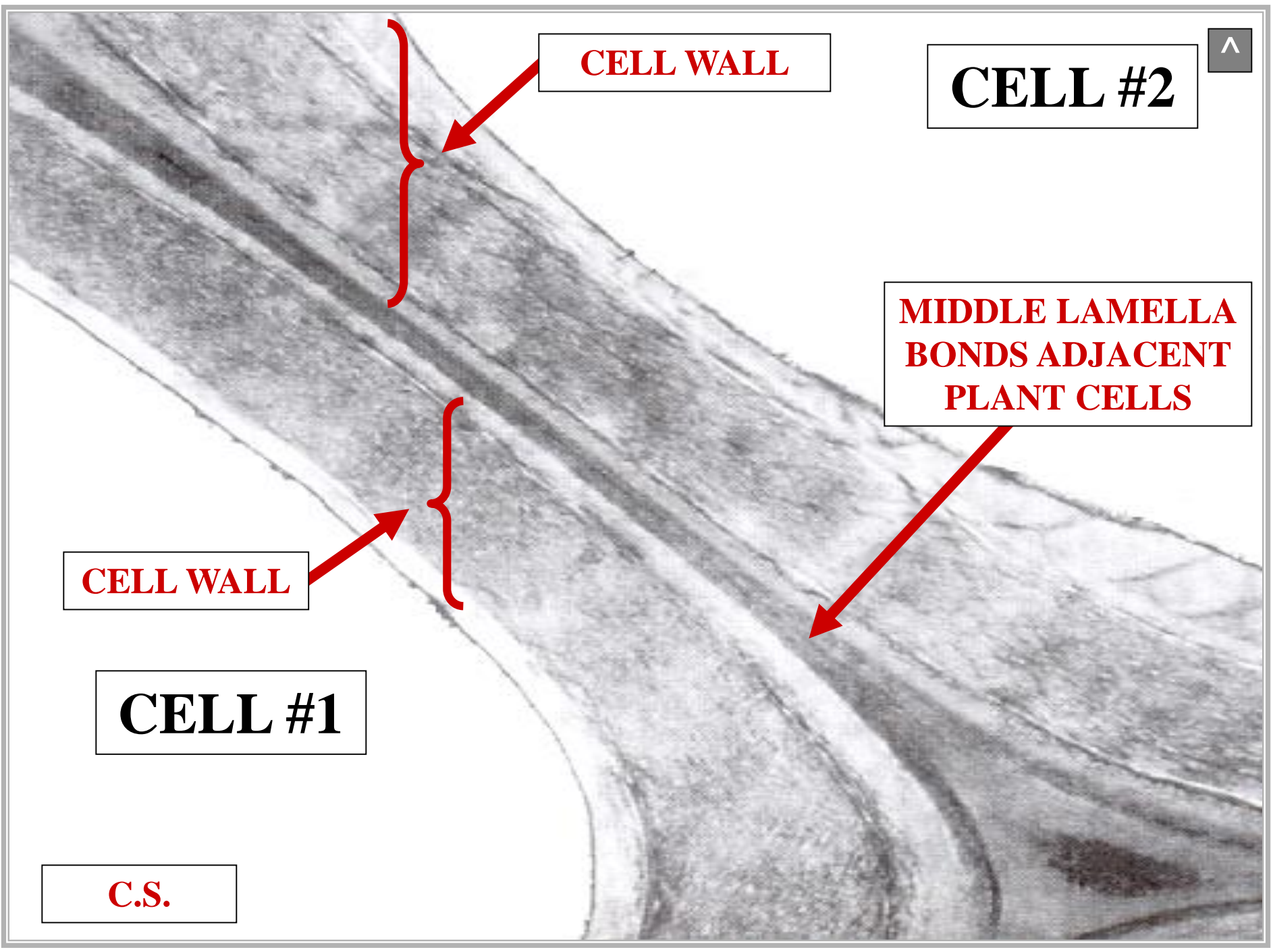
B

MIDDLE LAMELLA

CELL WALL

CELL #1

C.S.



CELL WALL

CELL #2



**MIDDLE LAMELLA
BONDS ADJACENT
PLANT CELLS**

CELL WALL

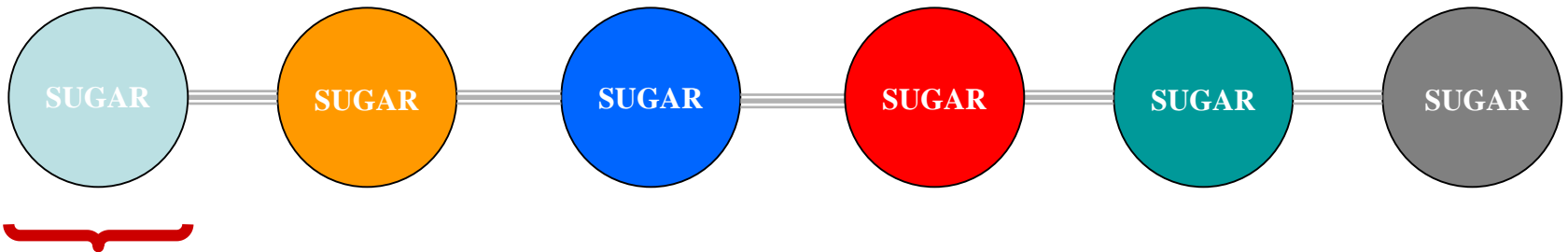
CELL #1

C.S.



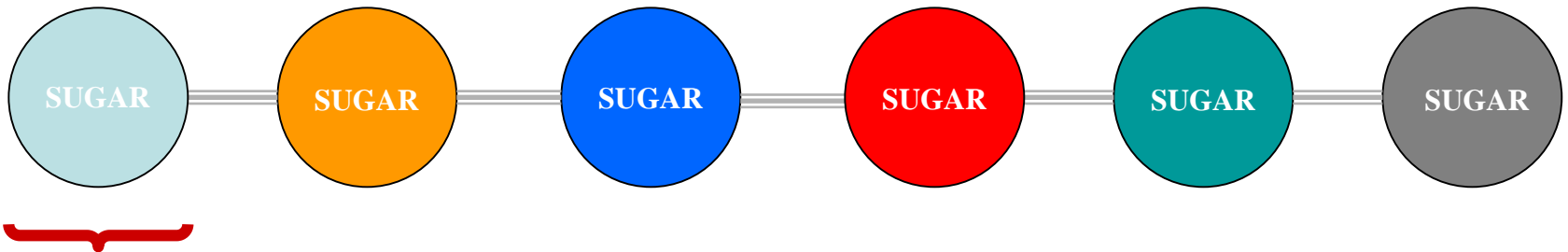
MIDDLE LAMELLA COMPOSITION

MIDDLE LAMELLA COMPOSITION



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

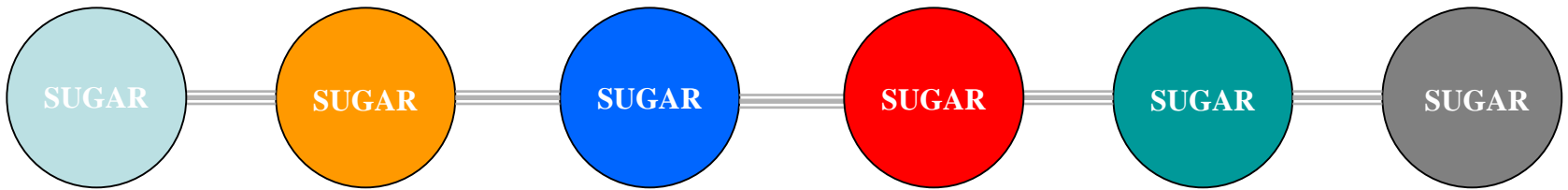
MIDDLE LAMELLA COMPOSITION



MONOSACCHARIDE \equiv **BOND**

?

MIDDLE LAMELLA COMPOSITION



MONOSACCHARIDE == = **BOND**



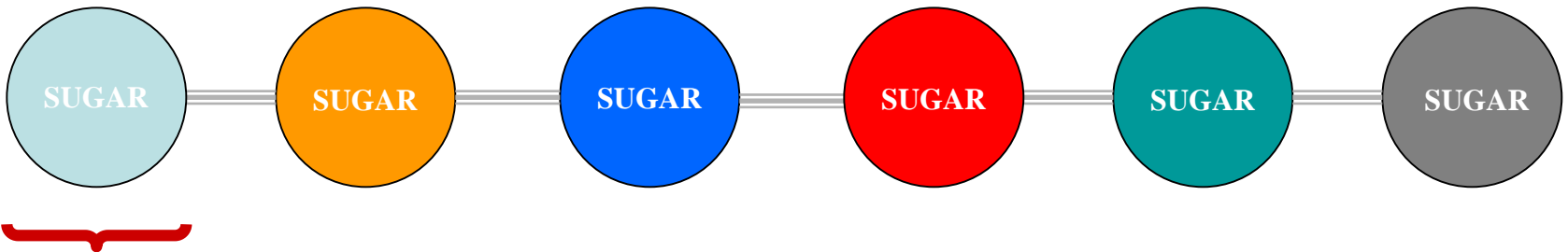
POLYSACCHARIDE



M

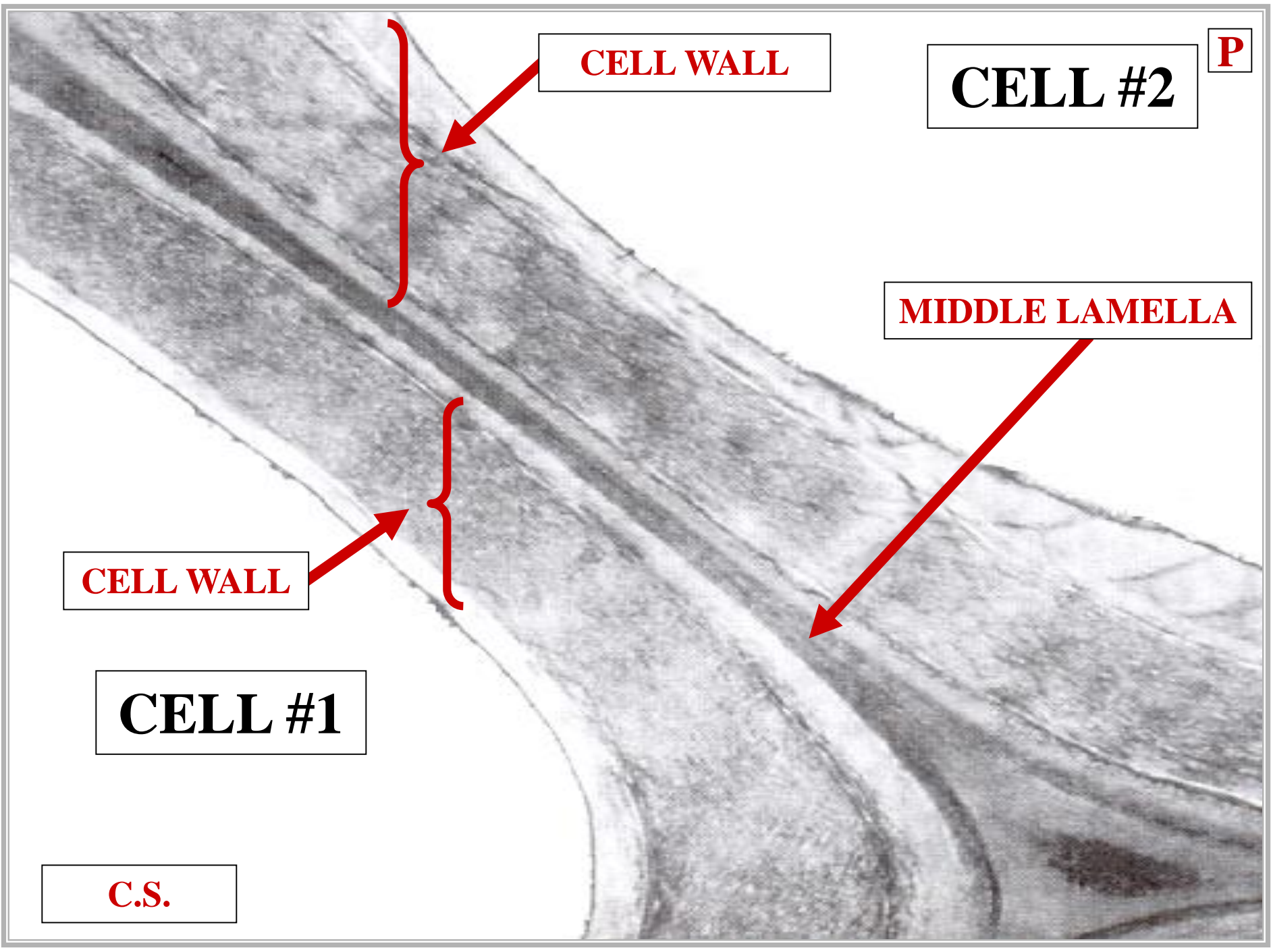
+

MIDDLE LAMELLA COMPOSITION



MONOSACCHARIDE == = **BOND**

POLYSACCHARIDE = PECTIN



CELL WALL

CELL #2

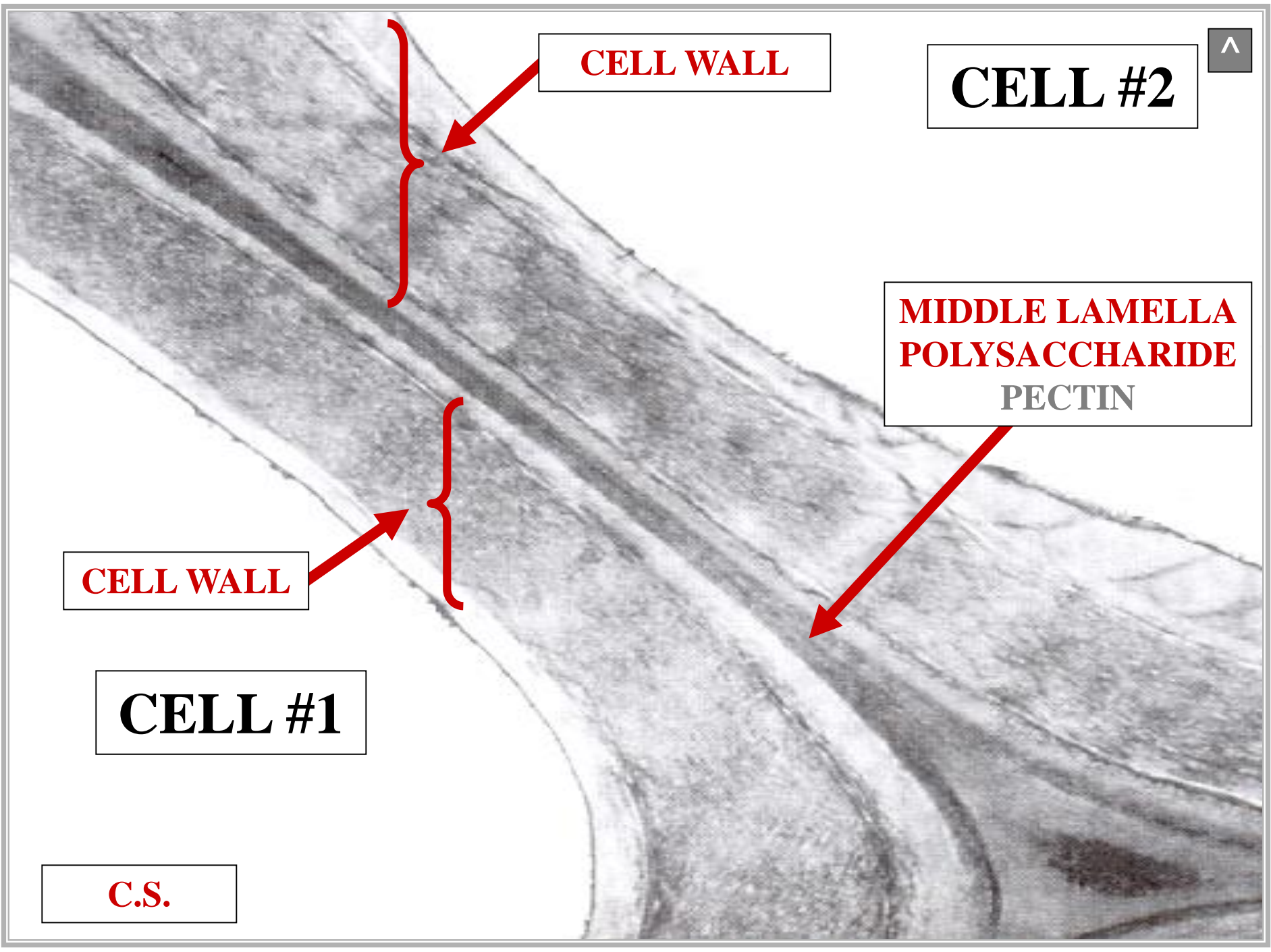
P

MIDDLE LAMELLA

CELL WALL

CELL #1

C.S.



CELL WALL

CELL #2



**MIDDLE LAMELLA
POLYSACCHARIDE
PECTIN**

CELL WALL

CELL #1

C.S.

DESMOSOMES

DESMOSOME



DESMOSOME

**CELL MEMBRANE CONTACT
PT BETWEEN ADJACENT
ANIMAL CELLS**

DESMOSOME



DESMOSOME

**CELL MEMBRANE CONTACT
PT BETWEEN ADJACENT
ANIMAL CELLS**

**BONDS ADJACENT
ANIMAL CELLS**

DESMOSOME



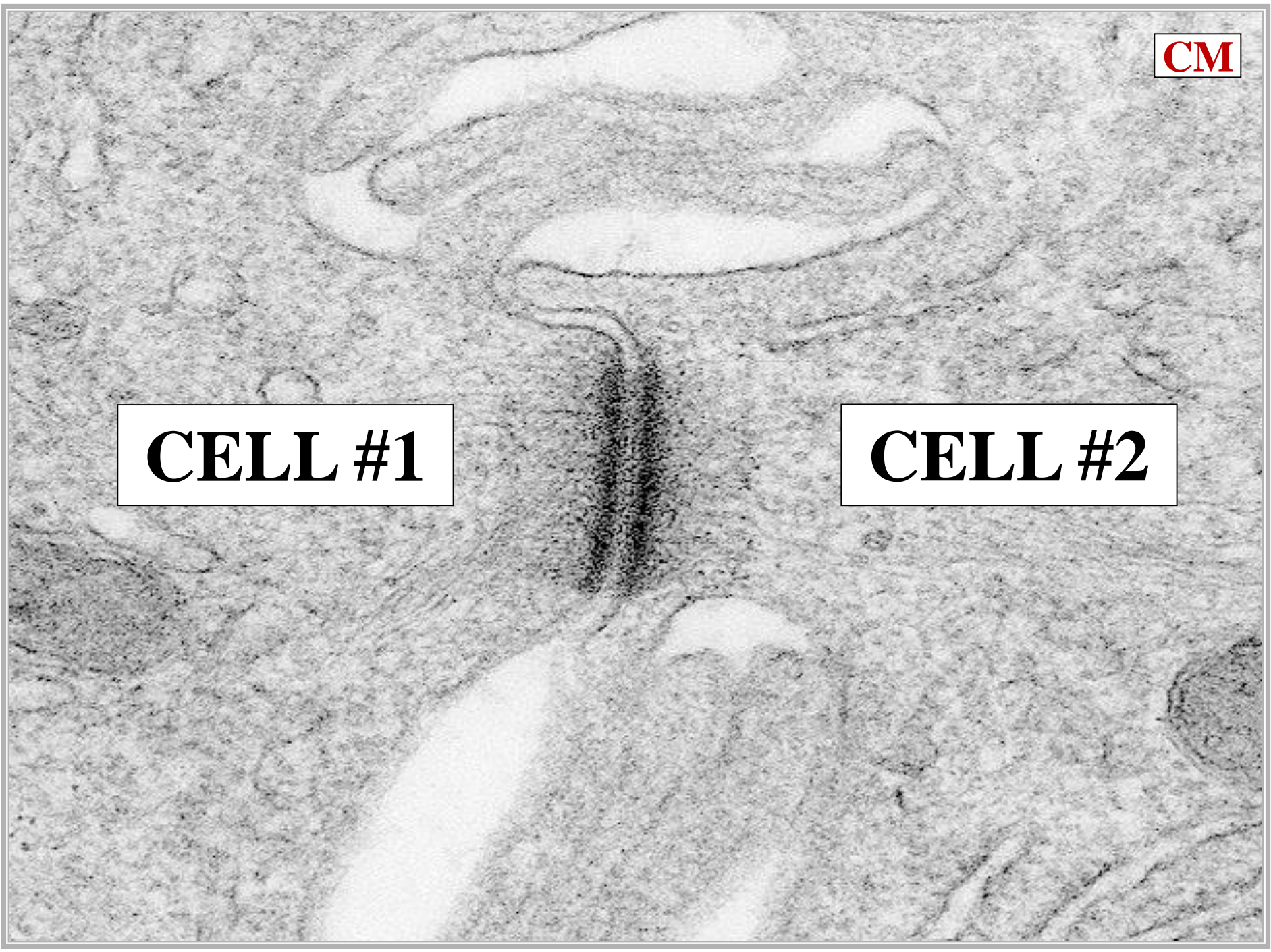
ANIMAL CELLS ONLY



CM

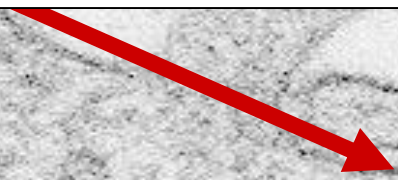
CELL #1

CELL #2



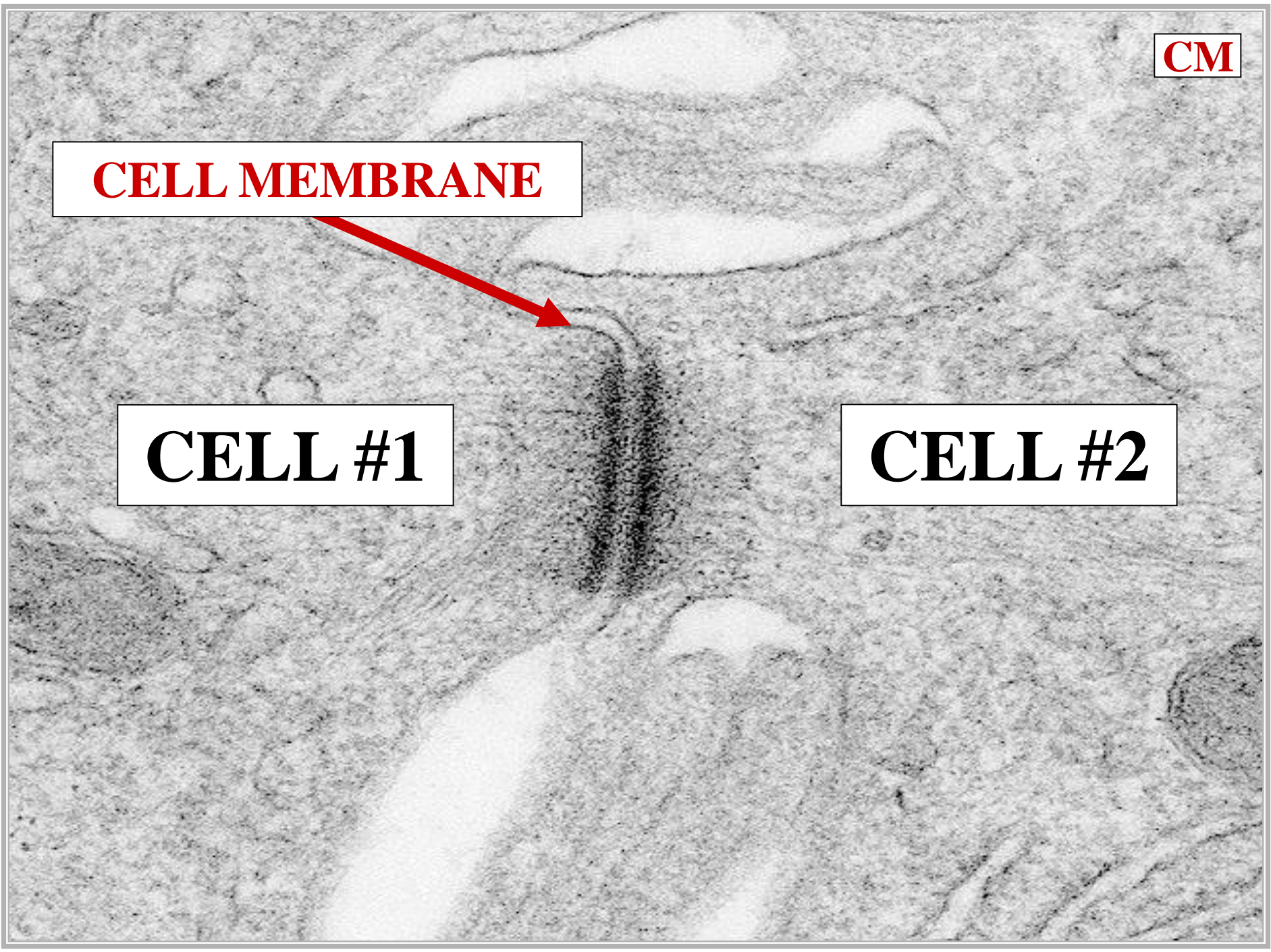
CM

CELL MEMBRANE



CELL #1

CELL #2



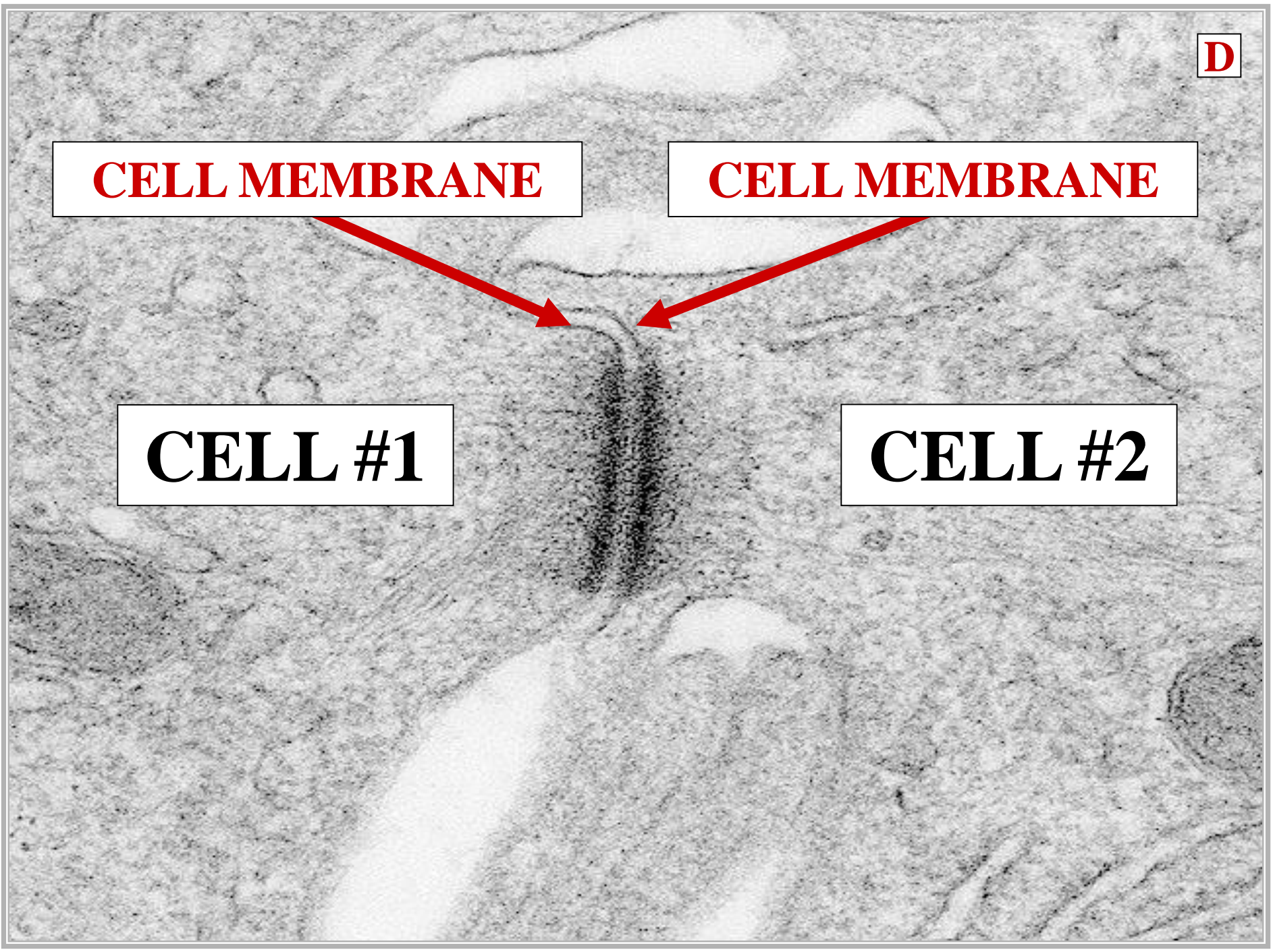
D

CELL MEMBRANE

CELL MEMBRANE

CELL #1

CELL #2



B

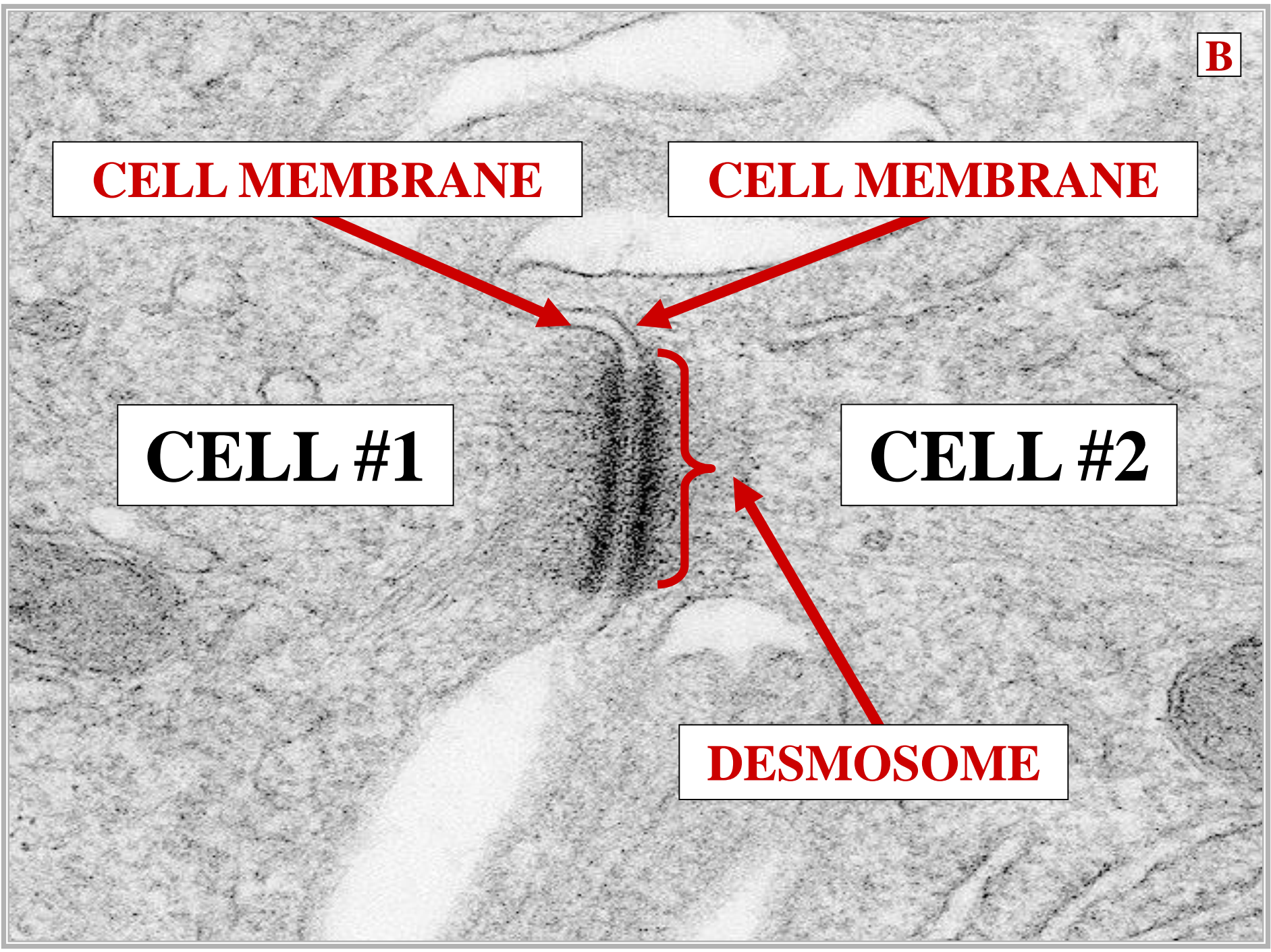
CELL MEMBRANE

CELL MEMBRANE

CELL #1

CELL #2

DESMOSOME



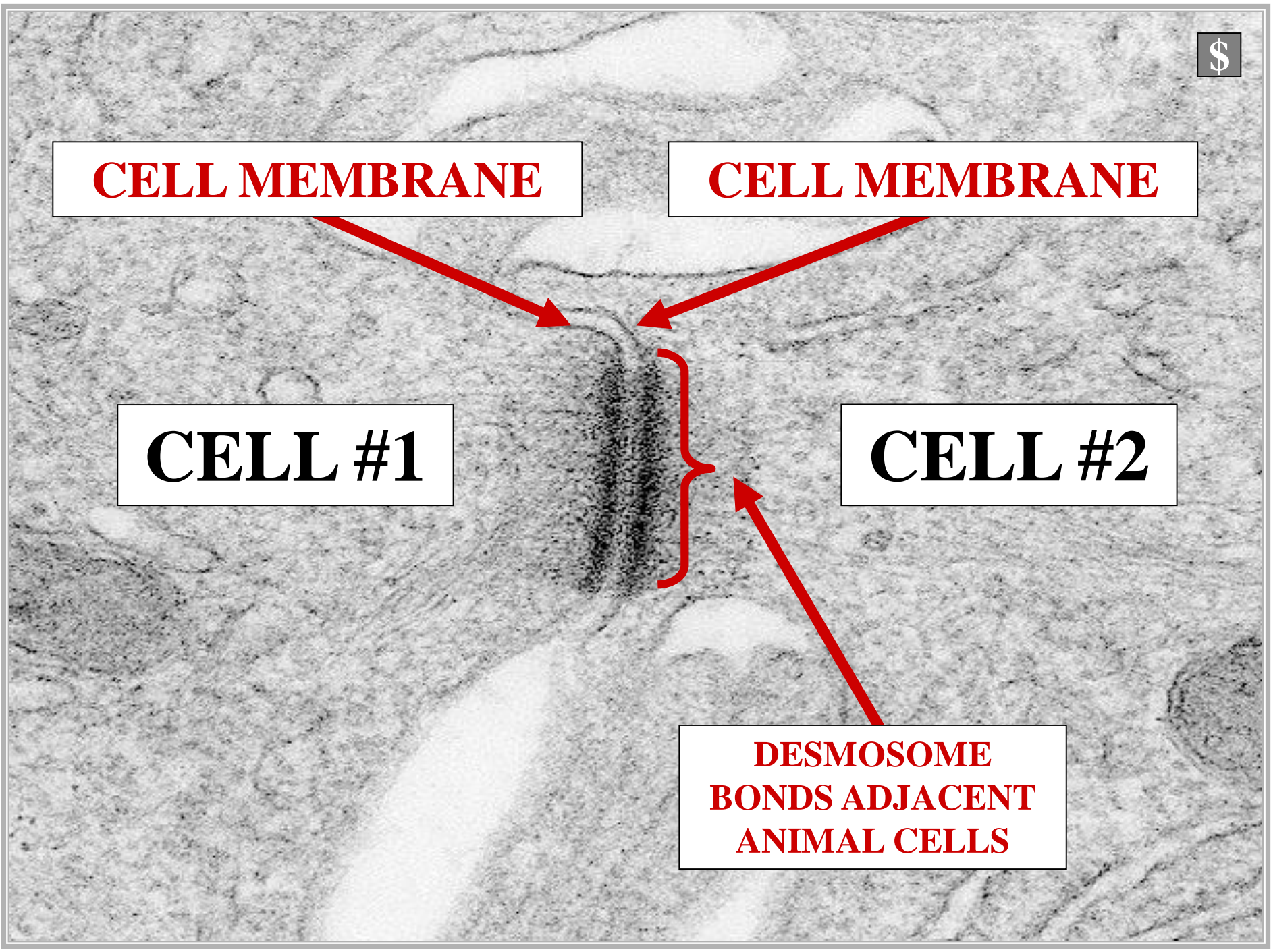
CELL MEMBRANE

CELL MEMBRANE

CELL #1

CELL #2

**DESMOSOME
BONDS ADJACENT
ANIMAL CELLS**





MIDDLE LAMELLA AND DESMOSOMES SUMMARY



M
B

PLANT CELLS





MIDDLE LAMELLA

BONDS ADJACENT PLANT CELLS





D
B

ANIMAL CELLS





DESMOSOMES

BOND ADJACENT ANIMAL CELLS



CELL WALL

CELL WALL



CELL WALL

NON-LIVING RIGID LAYER

CELL WALL



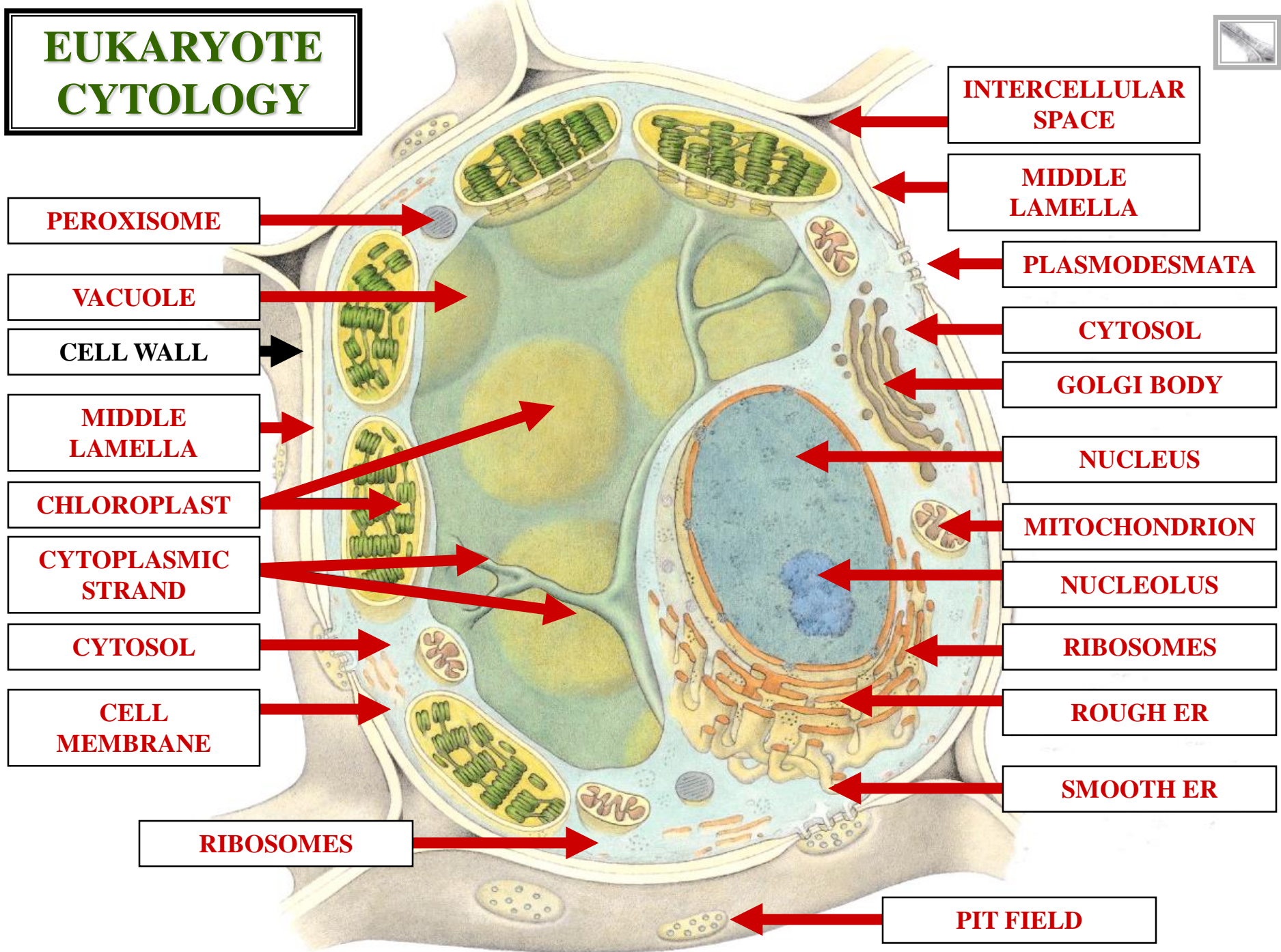
CELL WALL

NON-LIVING RIGID LAYER

**SUPPORTS & PROTECTS
CELL**

CELL WALL

EUKARYOTE CYTOLOGY





CELL #2

The image shows a grayscale micrograph of a biological specimen, likely a cross-section of a plant stem or a similar structure. The specimen is oriented diagonally from the top-left to the bottom-right. It consists of several distinct layers or cells. Two cells are specifically labeled: 'CELL #1' is located in the lower-left quadrant, and 'CELL #2' is located in the upper-right quadrant. A central structure, labeled 'C.S.', is visible in the lower-left quadrant, appearing as a curved, lighter-colored band. The overall texture is fibrous and layered, with varying shades of gray representing different cellular components.

C

CELL #1

C.S.

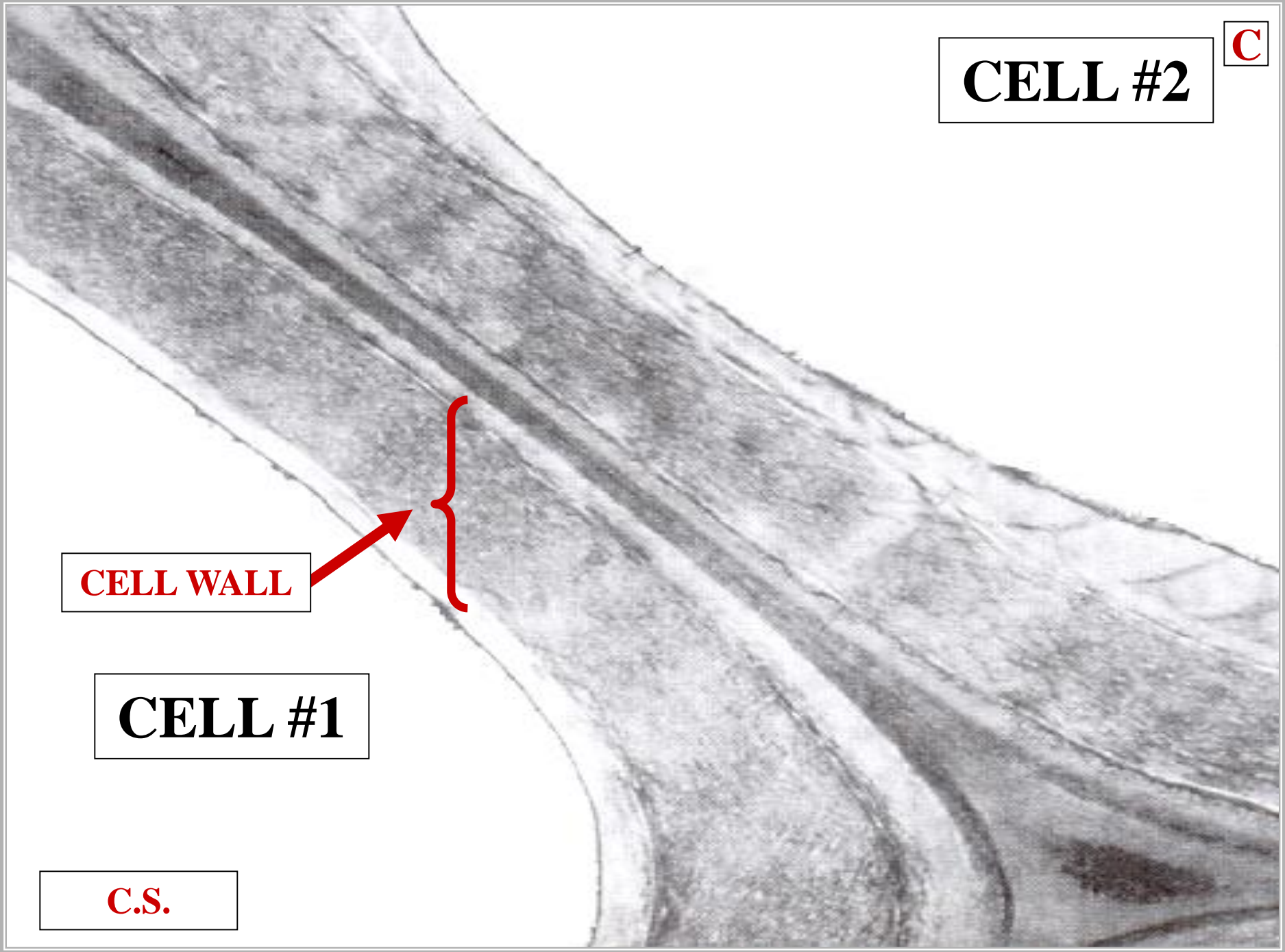
CELL #2

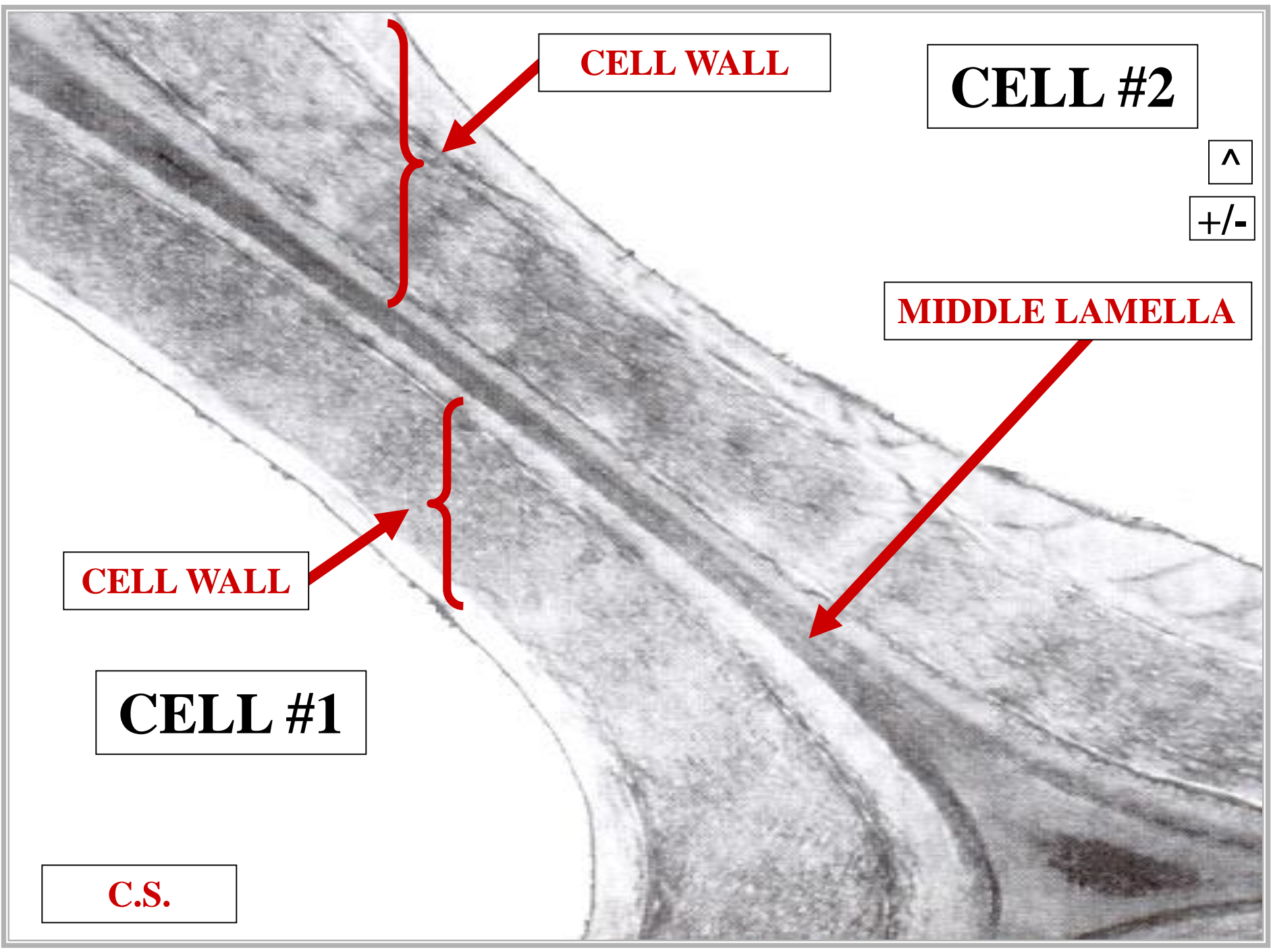
C

CELL WALL

CELL #1

C.S.





CELL WALL

CELL #2

^

+/-

MIDDLE LAMELLA

CELL WALL

CELL #1

C.S.



**CELL WALL
PRESENT
OR
ABSENT**



ANIMAL CELLS

CELL WALL: PRESENT OR ABSENT?





ABSENT

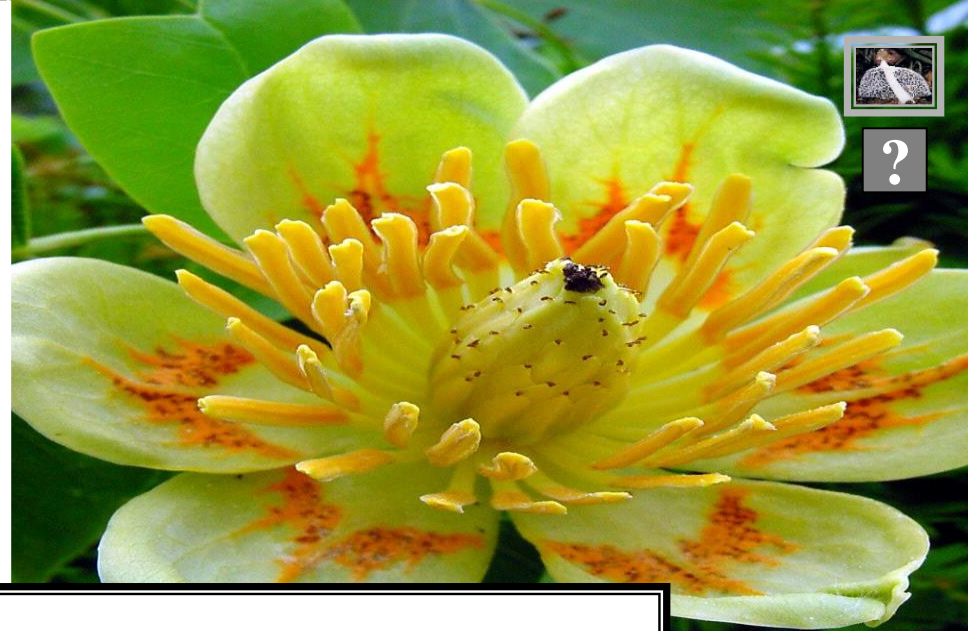




PLANT CELLS

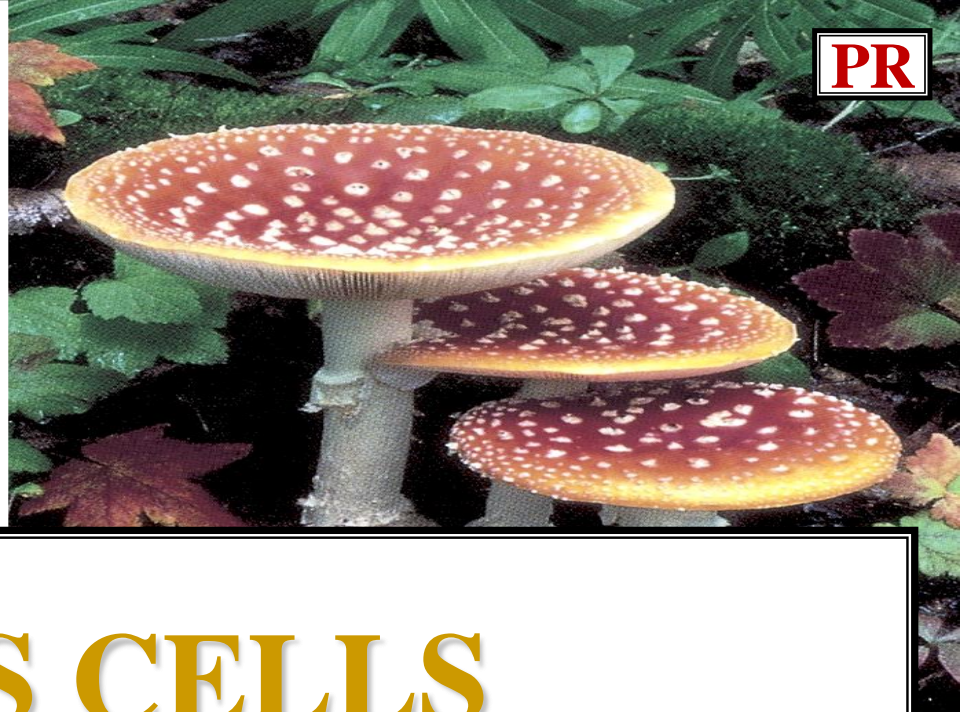
CELL WALL: PRESENT OR ABSENT?





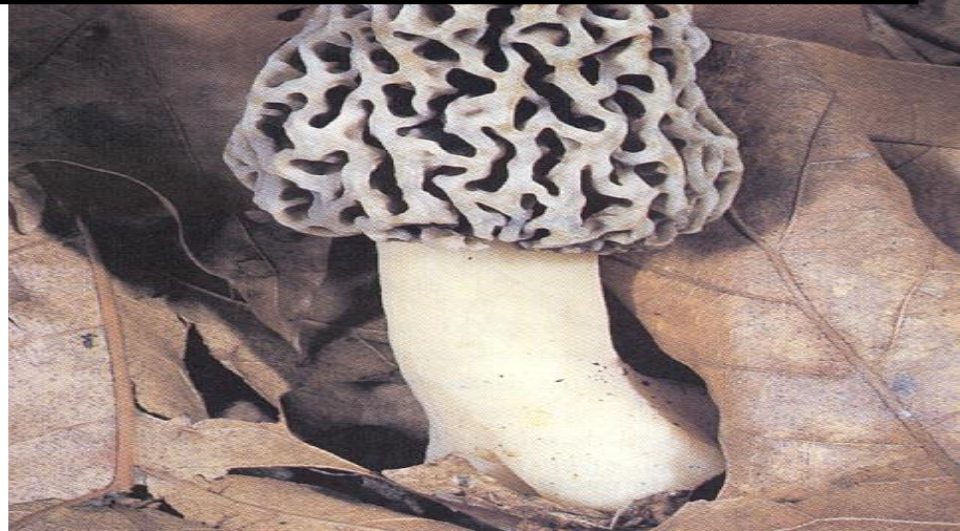
PRESENT





FUNGUS CELLS

CELL WALL : PRESENT OR ABSENT?





PRESENT



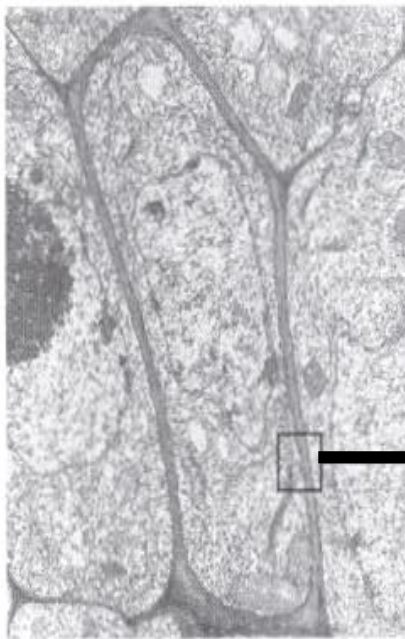
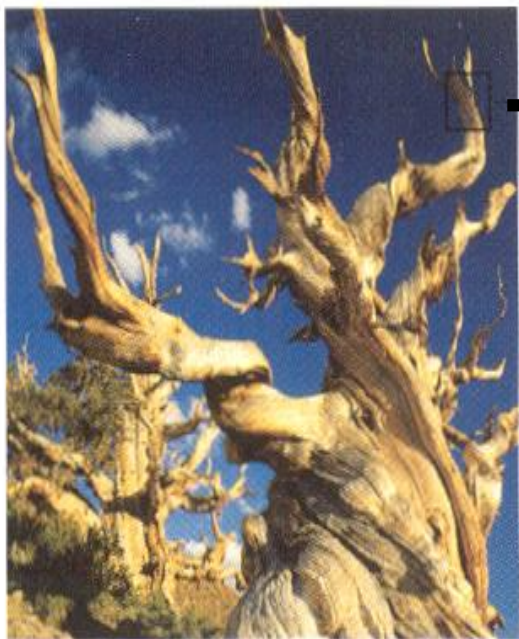


CELL WALL COMPOSITION



PLANT CELL WALL



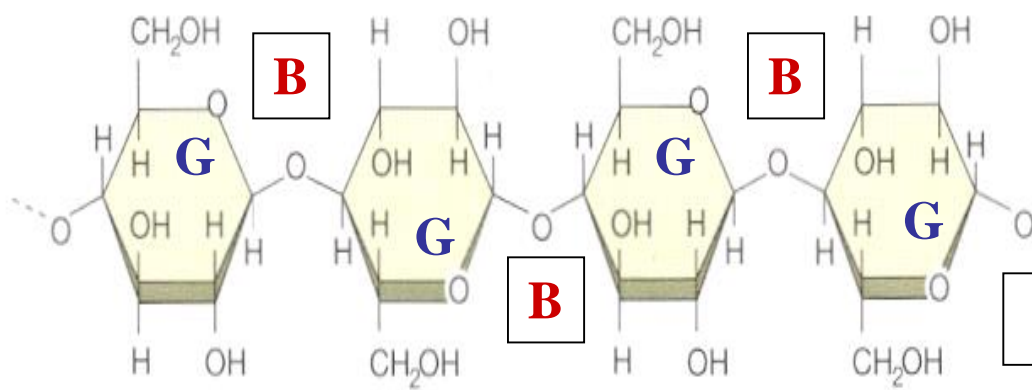
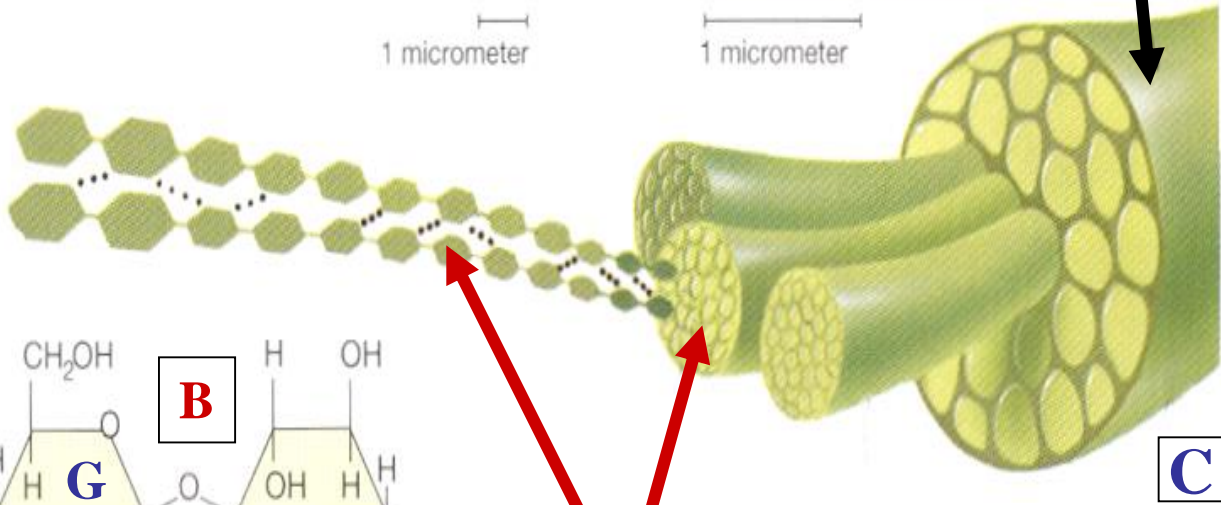


1 micrometer



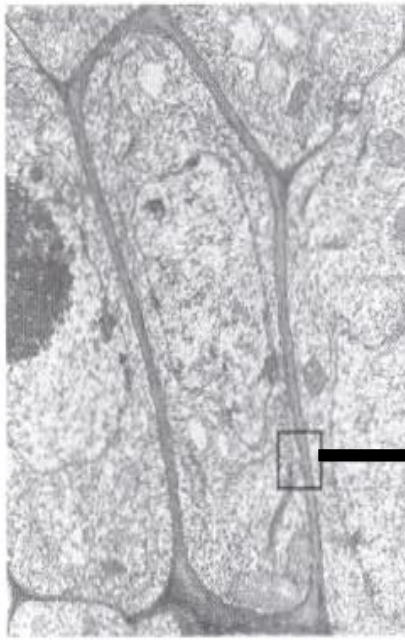
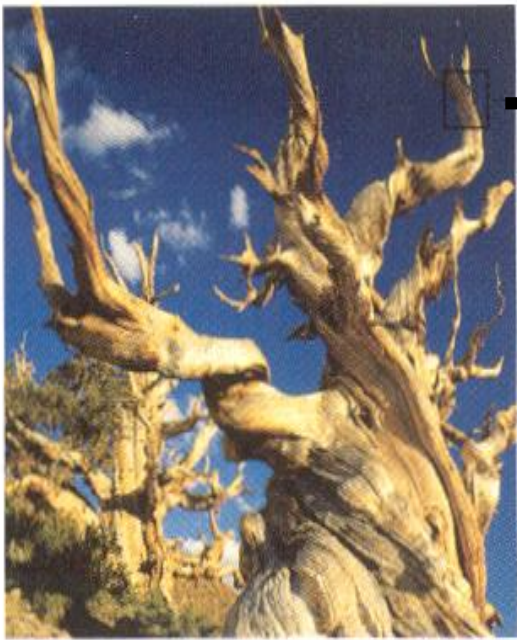
1 micrometer

PLANT CELL WALL

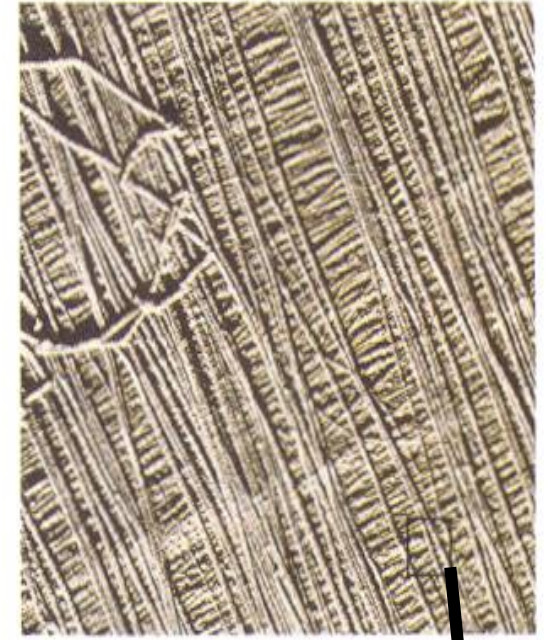


?

G = GLUCOSE
B = BETA BOND

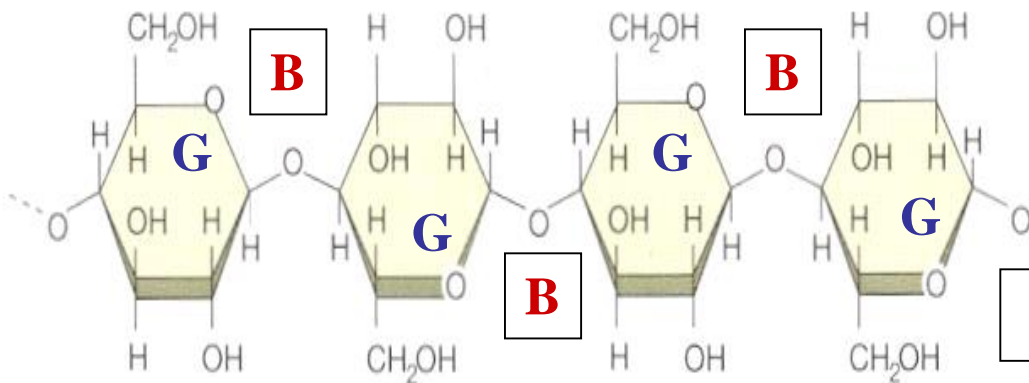
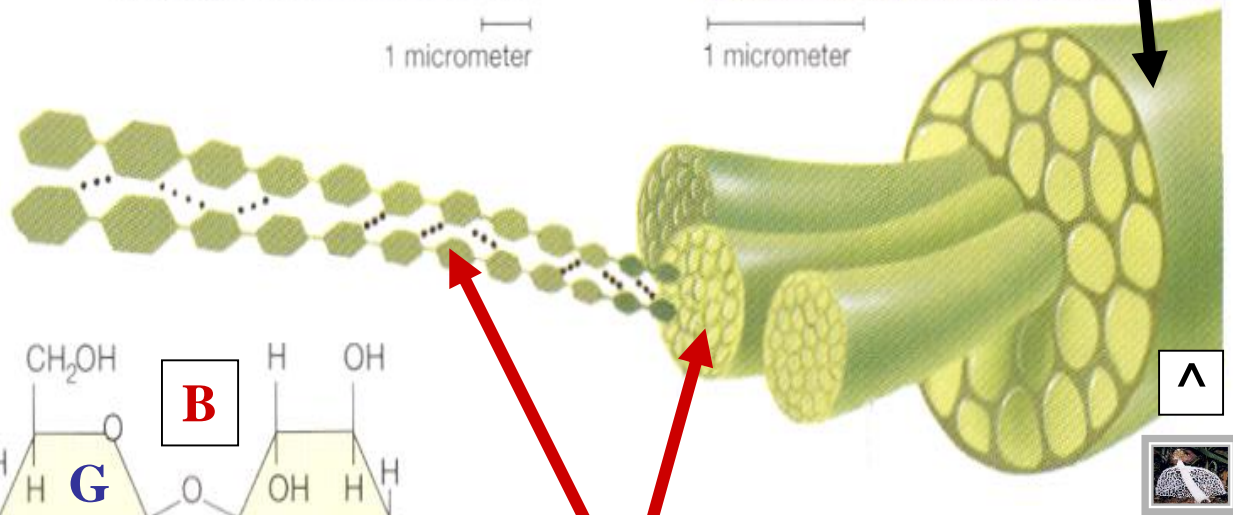


1 micrometer



1 micrometer

PLANT CELL WALL



CELLULOSE

G = GLUCOSE
B = BETA BOND





FUNGUS CELL WALL

