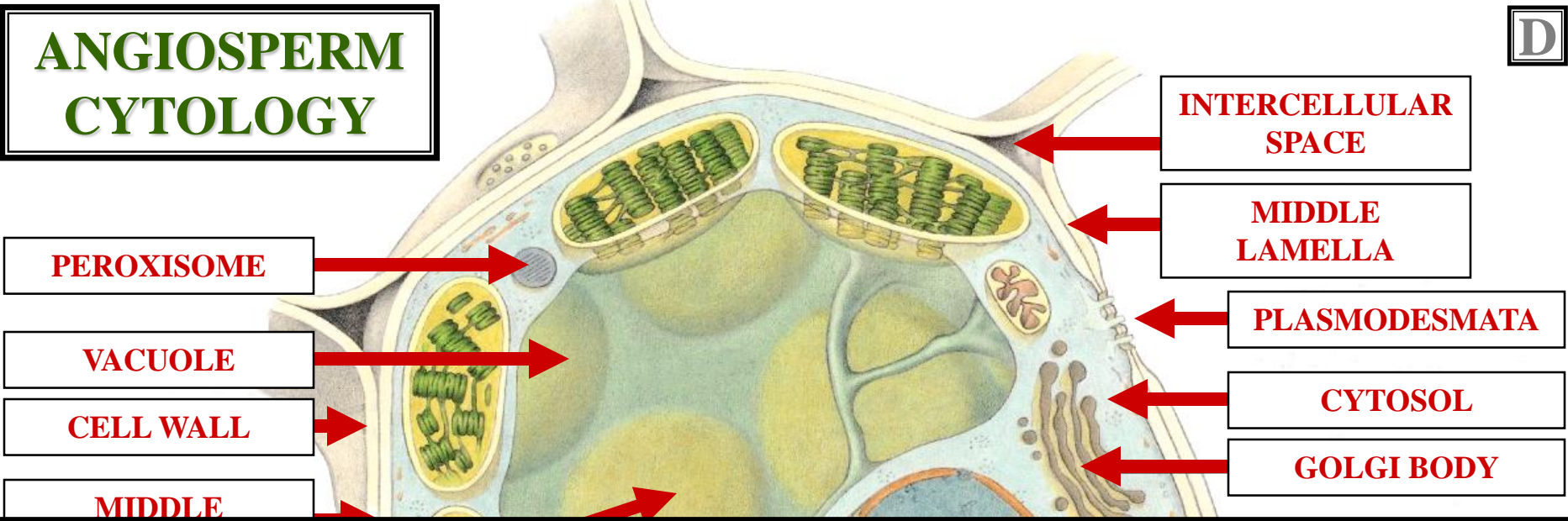


ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

SUMMARY

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

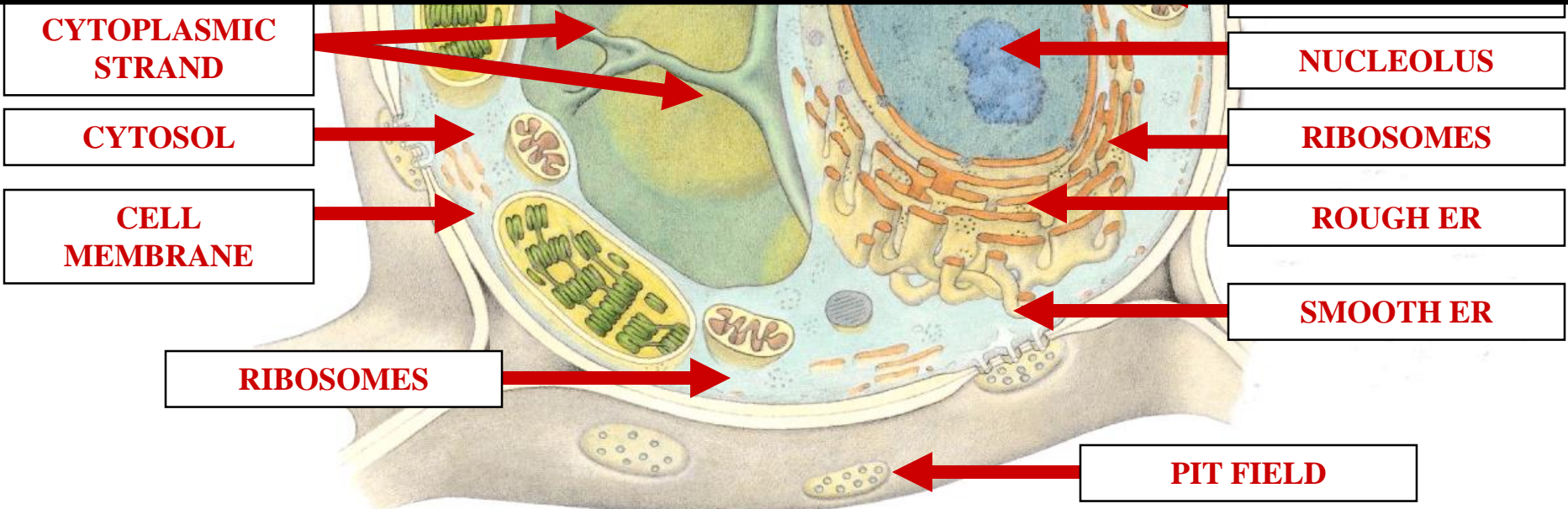
NUCLEOLUS

RIBOSOMES

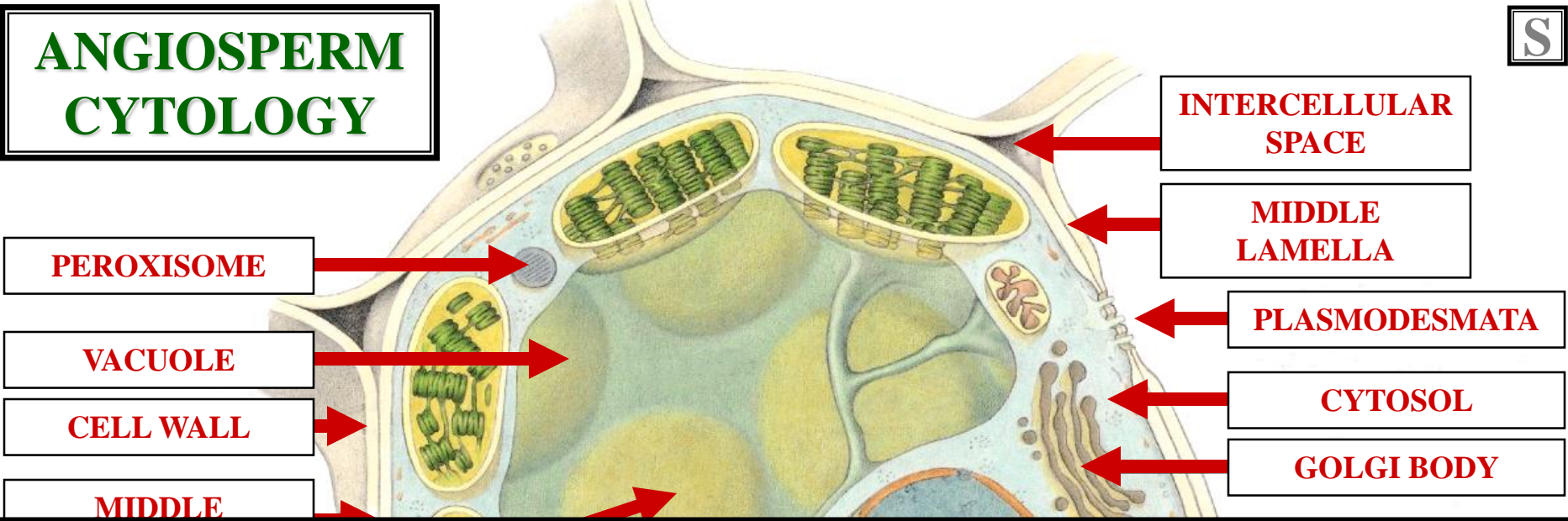
ROUGH ER

SMOOTH ER

PIT FIELD



ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

DOUBLE-MB ORGANELLES

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

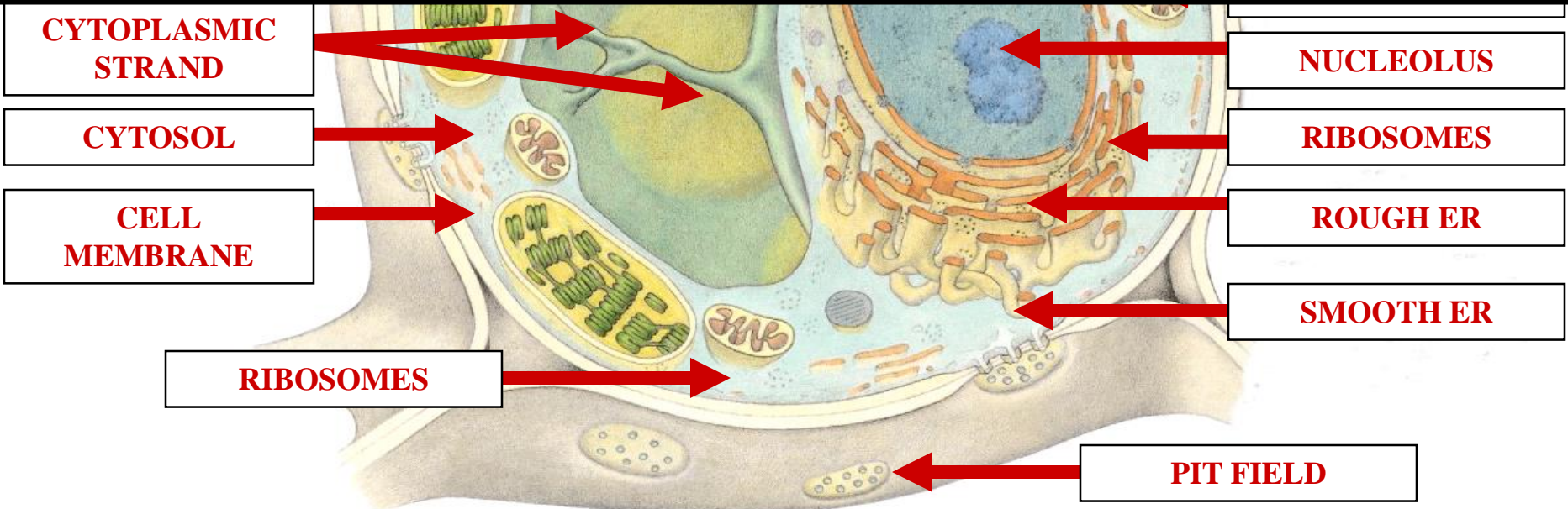
NUCLEOLUS

RIBOSOMES

ROUGH ER

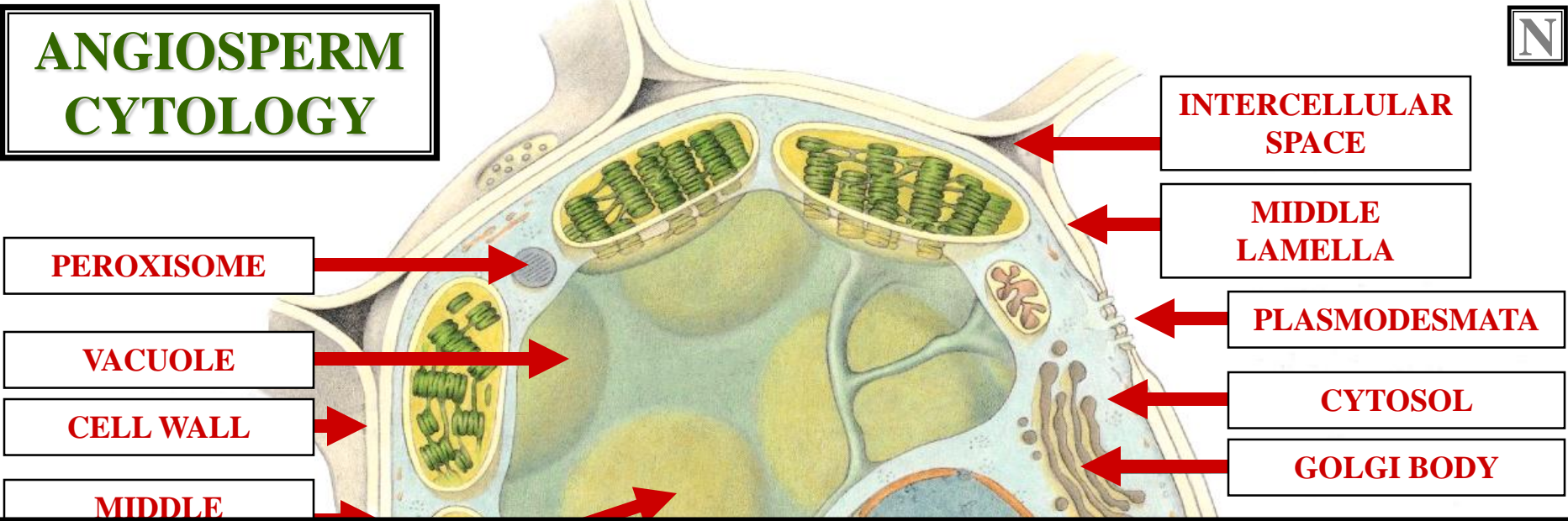
SMOOTH ER

PIT FIELD

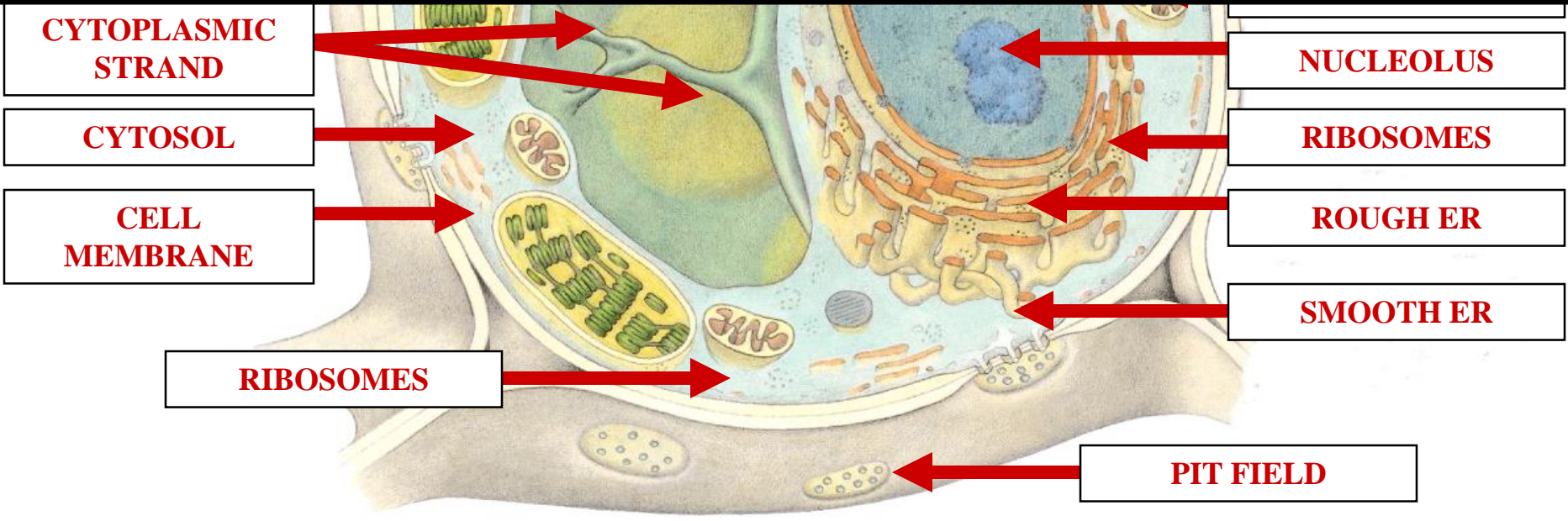




ANGIOSPERM CYTOLOGY

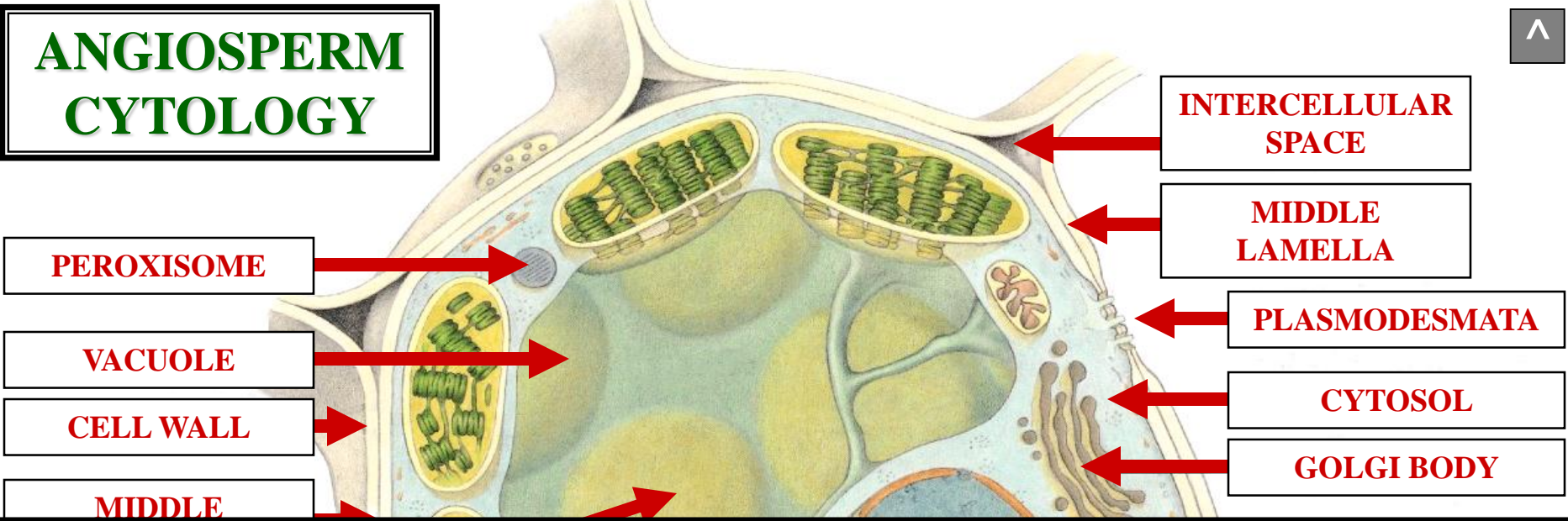


SINGLE-MB ORGANELLES

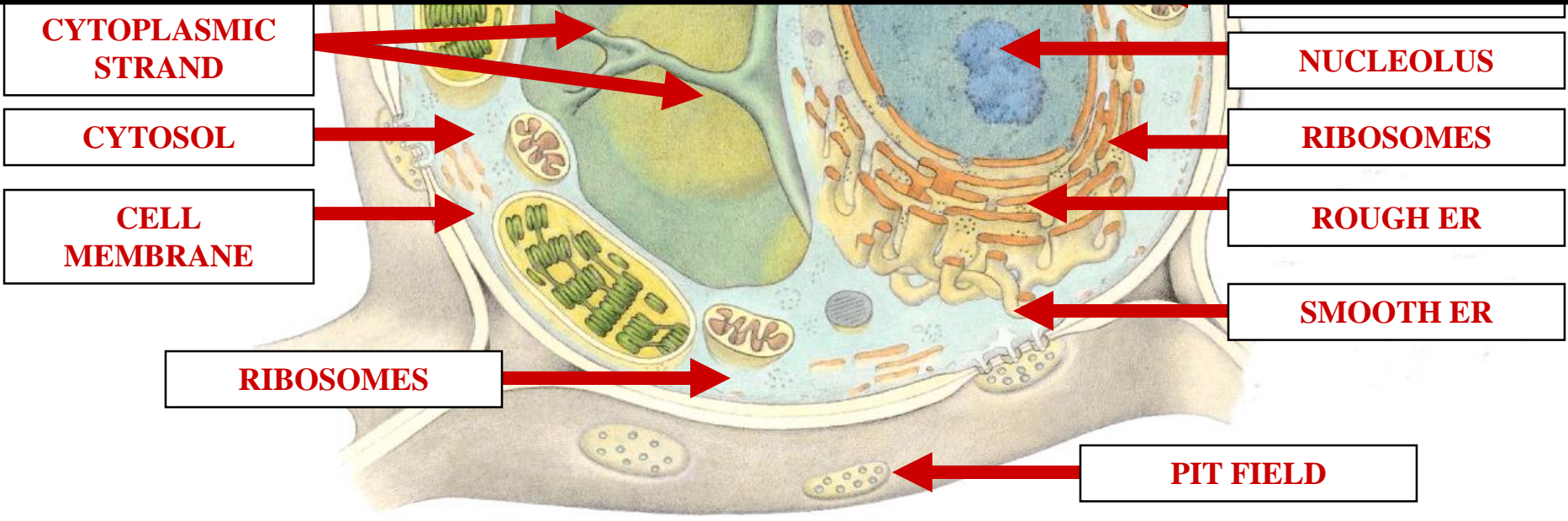




ANGIOSPERM CYTOLOGY



NON-MB ORGANELLE





NON-MEMBRANE BOUND ORGANELLE

RIBOSOME

RIBOSOMES



RIBOSOMES

**DISTRIBUTED THROUGHOUT
CYTOSOL**

RIBOSOMES



RIBOSOMES

**DISTRIBUTED THROUGHOUT
CYTOSOL**

**ASSOCIATED WITH
ENDOPLASMIC RETICULUM**

RIBOSOMES



RIBOSOMES

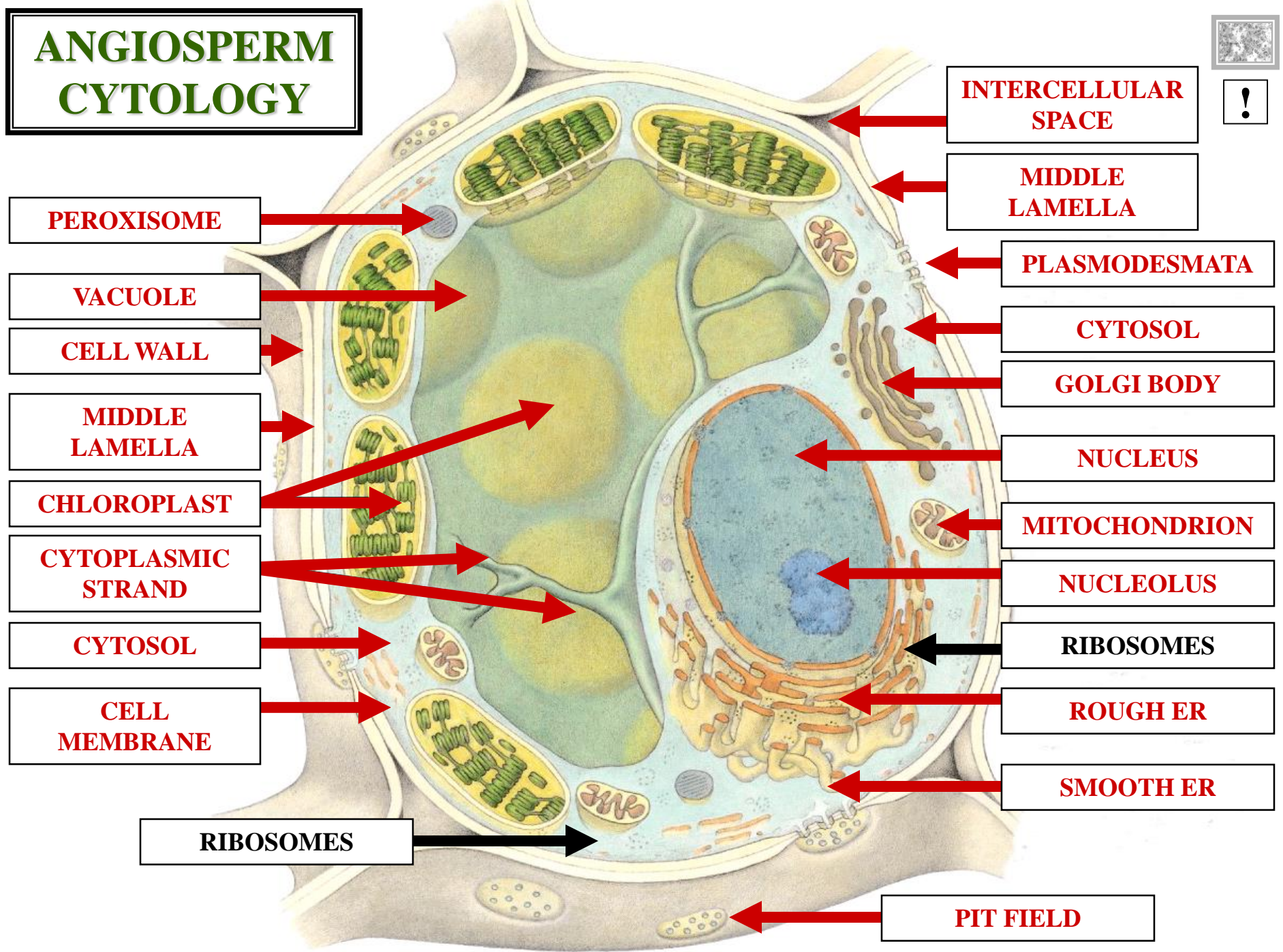
**DISTRIBUTED THROUGHOUT
CYTOSOL**

**ASSOCIATED WITH
ENDOPLASMIC RETICULUM**

SITE: PROTEIN SYNTHESIS

RIBOSOMES

ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE LAMELLA

CHLOROPLAST

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NUCLEUS

MITOCHONDRION

NUCLEOLUS

RIBOSOMES

ROUGH ER

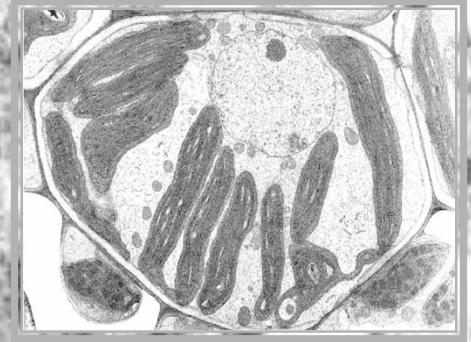
SMOOTH ER

PIT FIELD

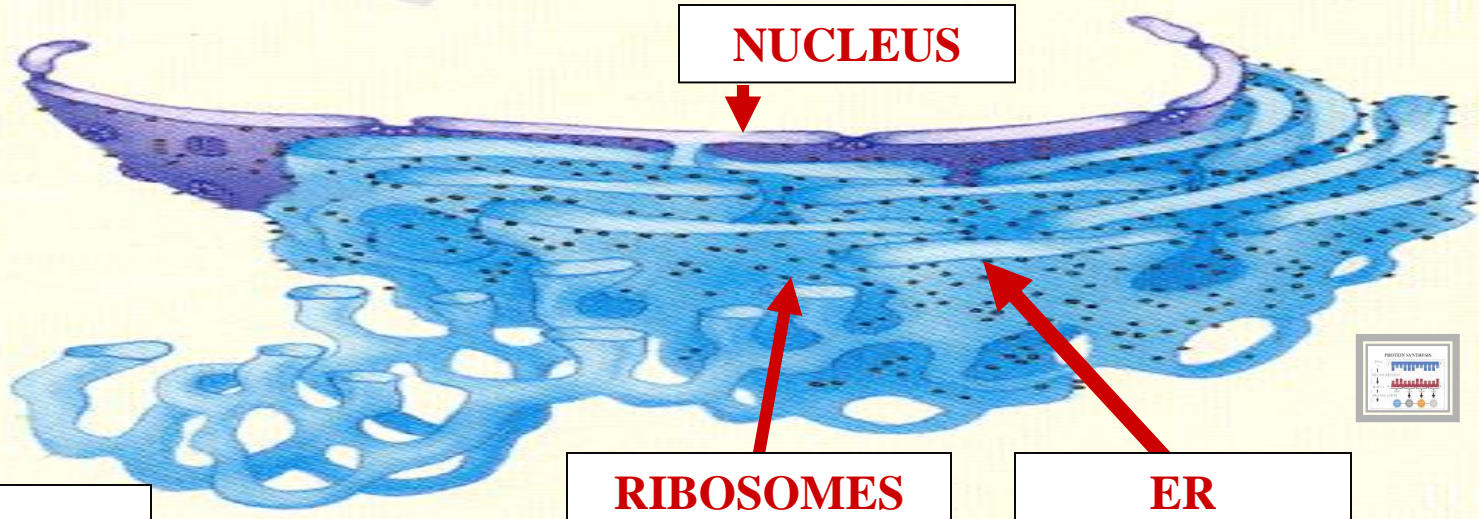
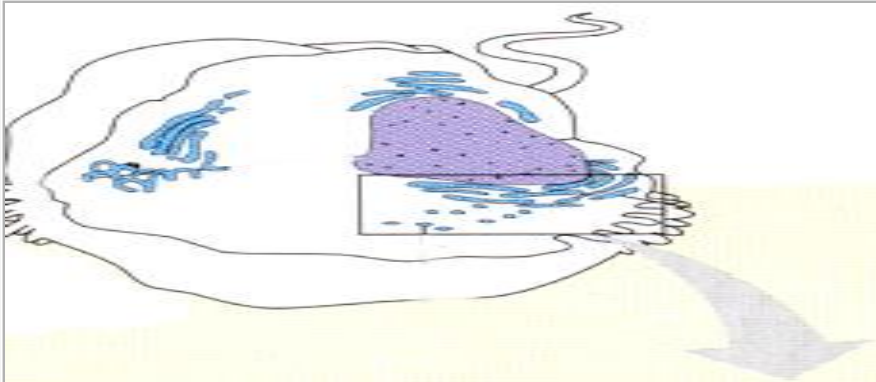


RIBOSOMES

CYTOSOL



ENDOPLASMIC RETICULUM RIBOSOMES

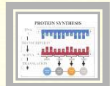
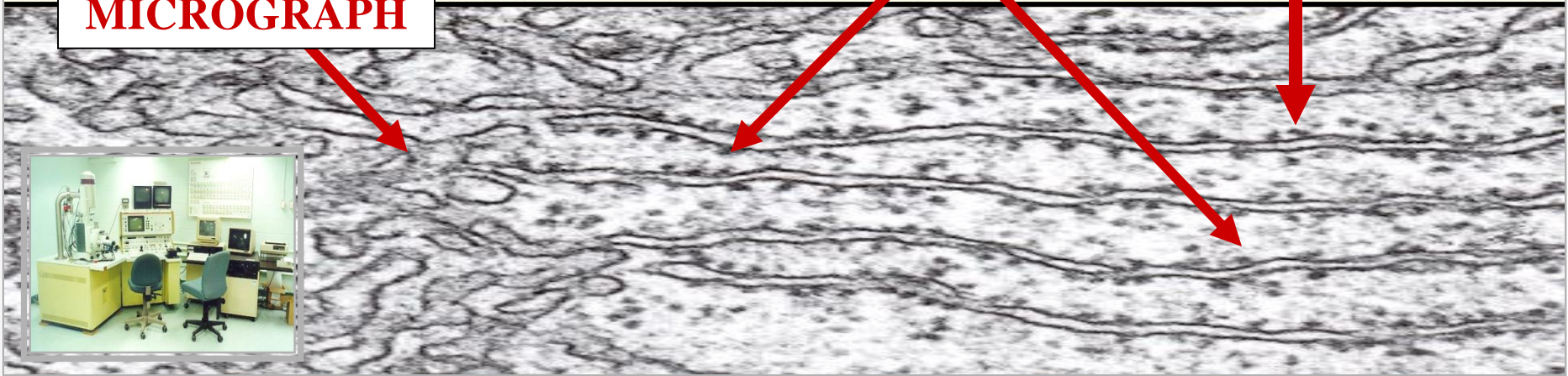


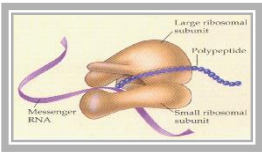
NUCLEUS

RIBOSOMES

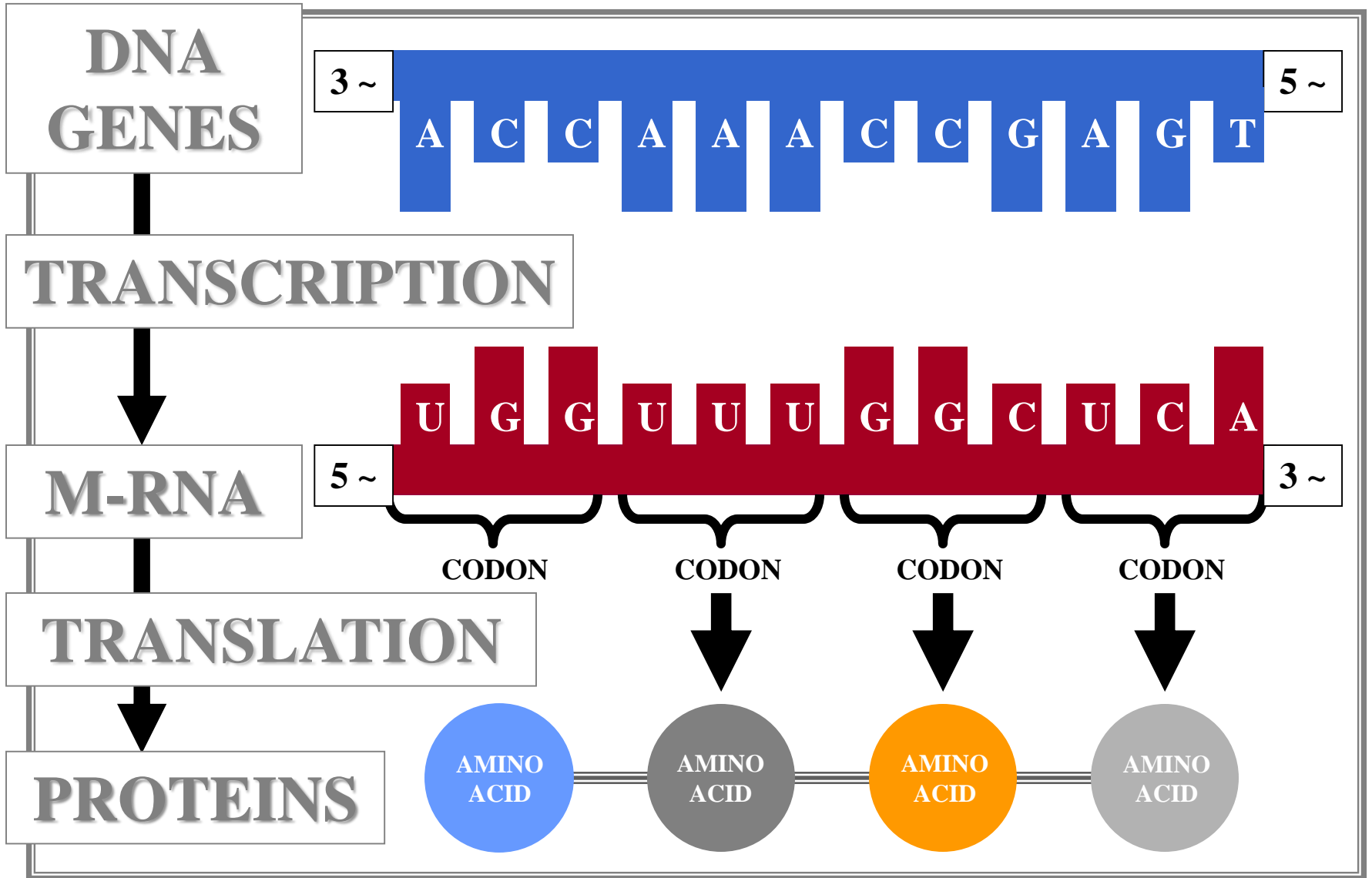
ER

**TEM
MICROGRAPH**





PROTEIN SYNTHESIS





RIBOSOME COMPOSITION

RIBOSOME COMPOSITION

**NUCLEIC ACID
PROTEIN
COMPLEX**

RIBOSOME COMPOSITION

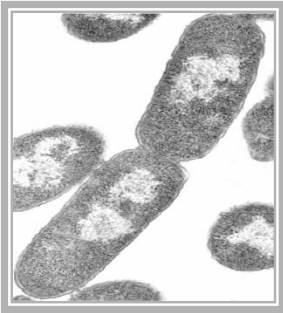
RIBOSOME COMPOSITION

P



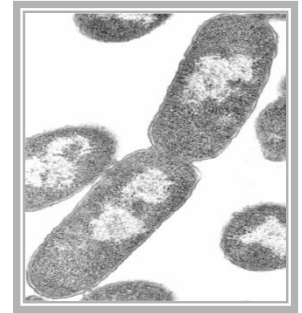
**RNA
PROTEIN
COMPLEX**

**RIBOSOME
COMPOSITION**



PROKARYOTE

PROKARYOTE RIBOSOME COMPOSITION



PROKARYOTE

E

4

3 RNAs & 54 PROTEINS

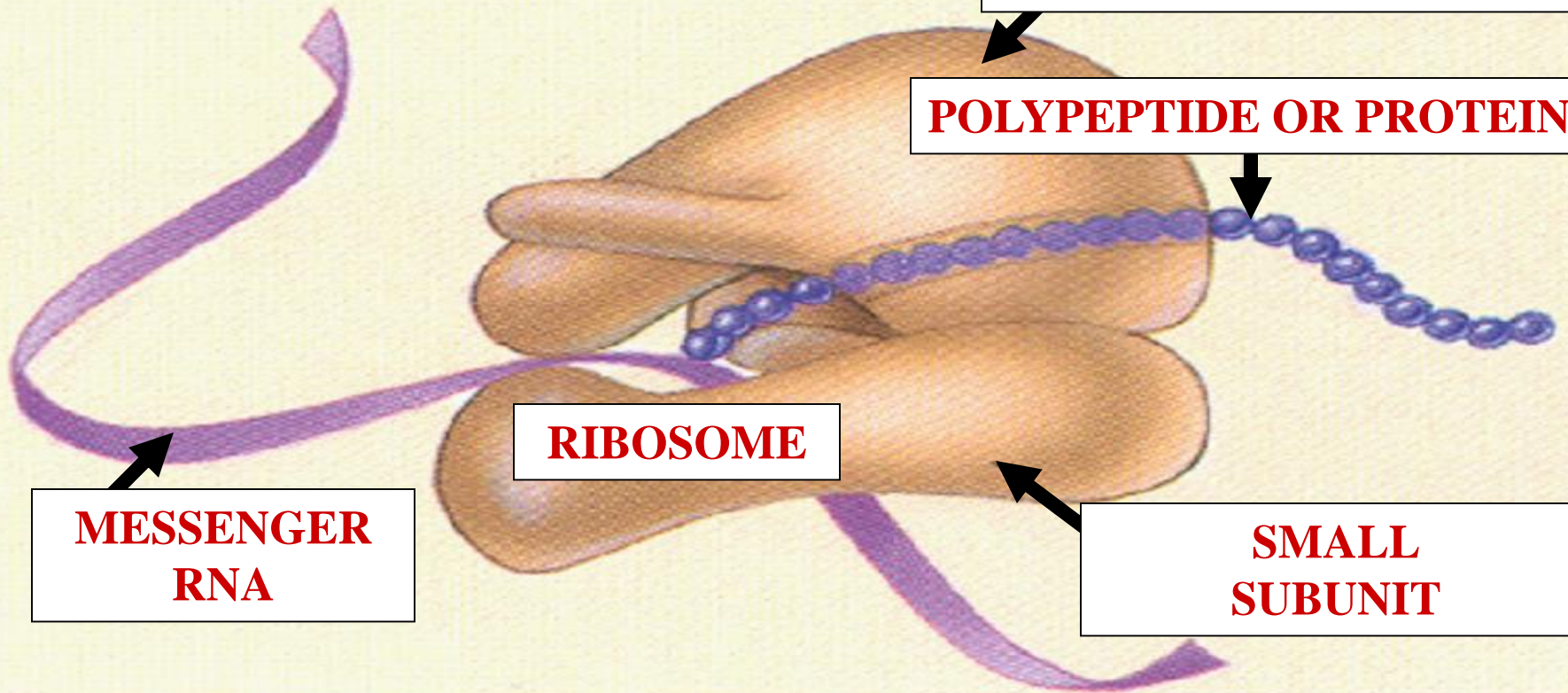
**LARGE
SUBUNIT**

POLYPEPTIDE OR PROTEIN

RIBOSOME

**MESSENGER
RNA**

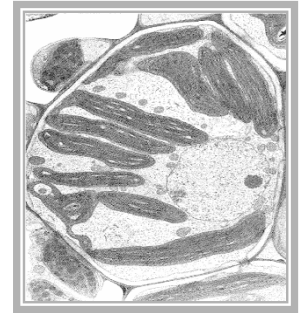
**SMALL
SUBUNIT**





EUKARYOTE

EUKARYOTE RIBOSOME COMPOSITION



EUKARYOTE

E
L

4 RNAs & 73 PROTEINS

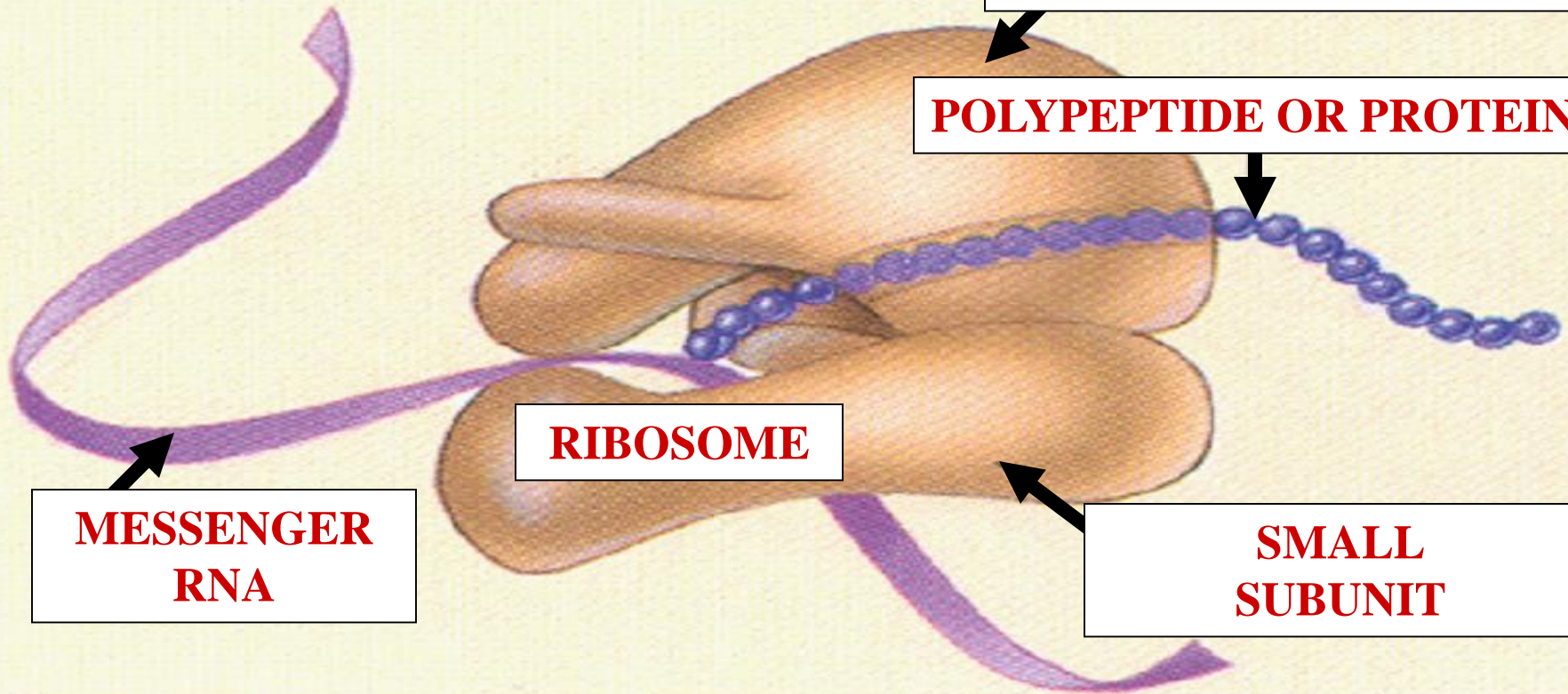
**LARGE
SUBUNIT**

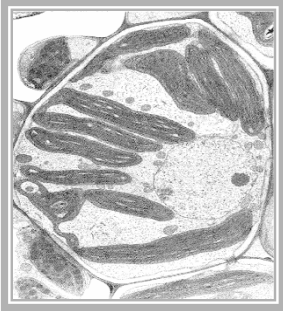
POLYPEPTIDE OR PROTEIN

RIBOSOME

**MESSENGER
RNA**

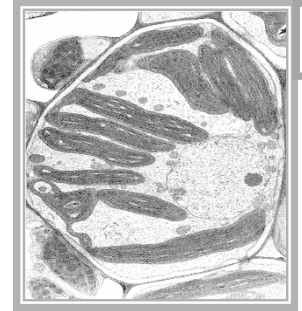
**SMALL
SUBUNIT**





EUKARYOTE

EUKARYOTE RIBOSOME LARGER



EUKARYOTE



4 RNAs & 73 PROTEINS

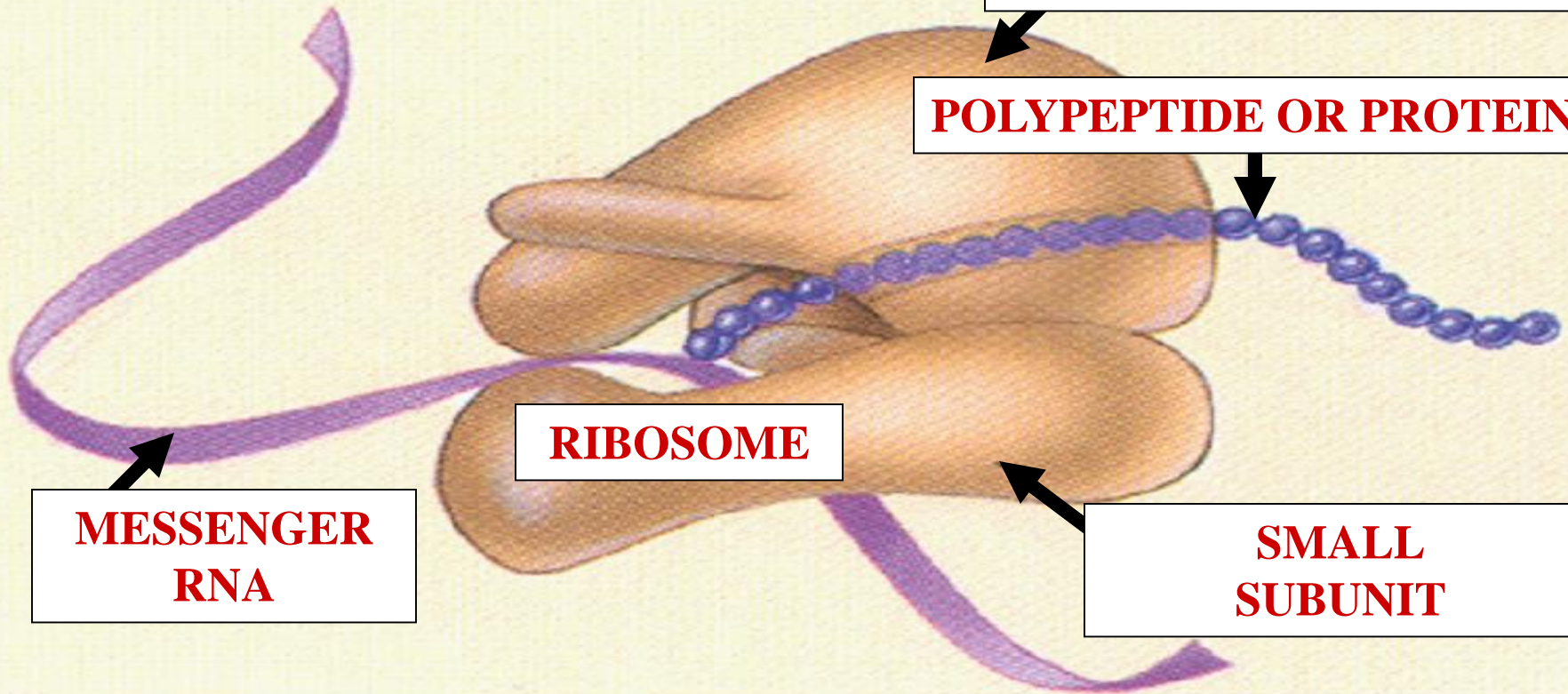
**LARGE
SUBUNIT**

POLYPEPTIDE OR PROTEIN

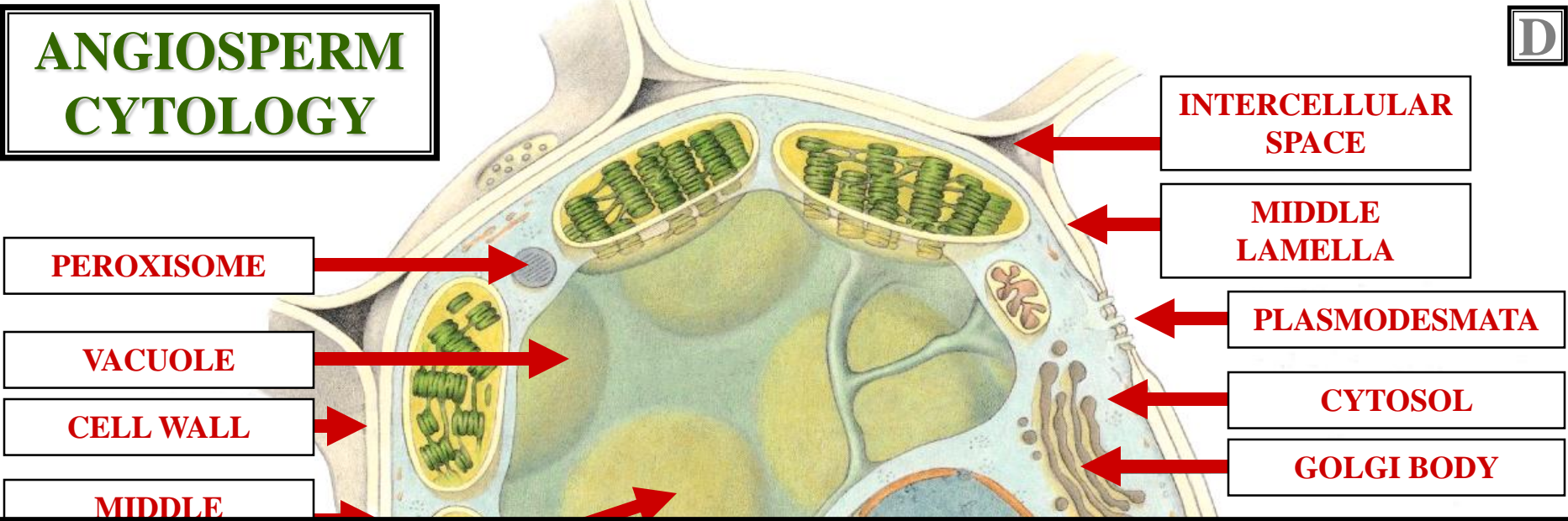
RIBOSOME

**MESSENGER
RNA**

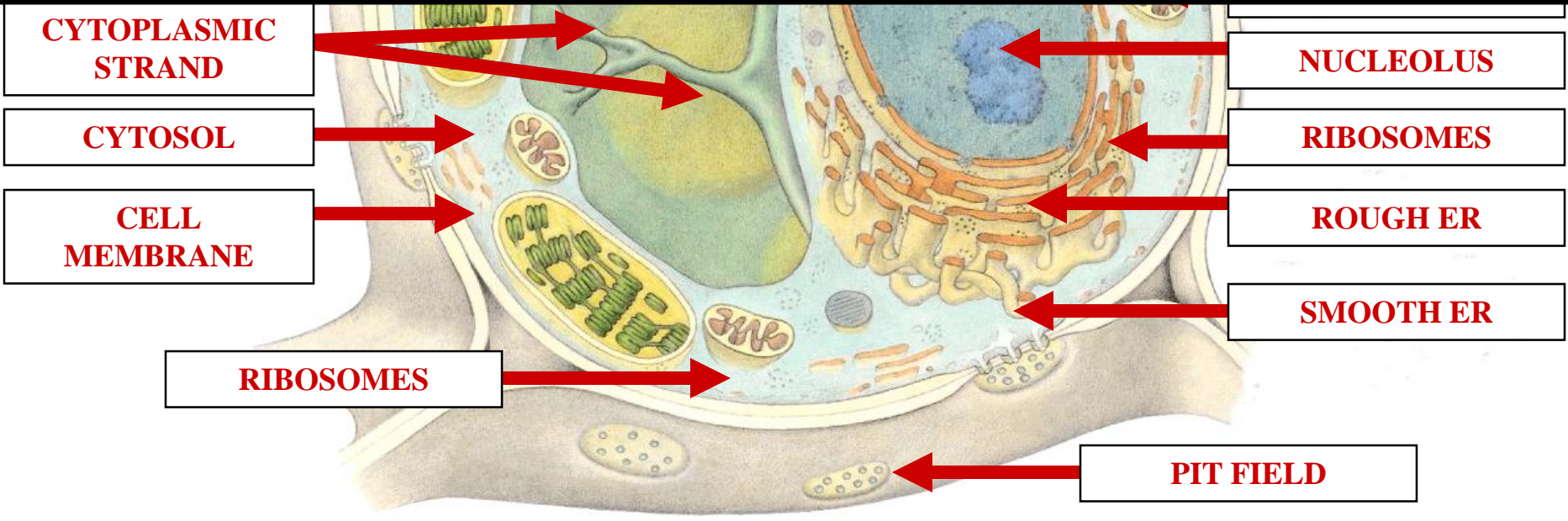
**SMALL
SUBUNIT**



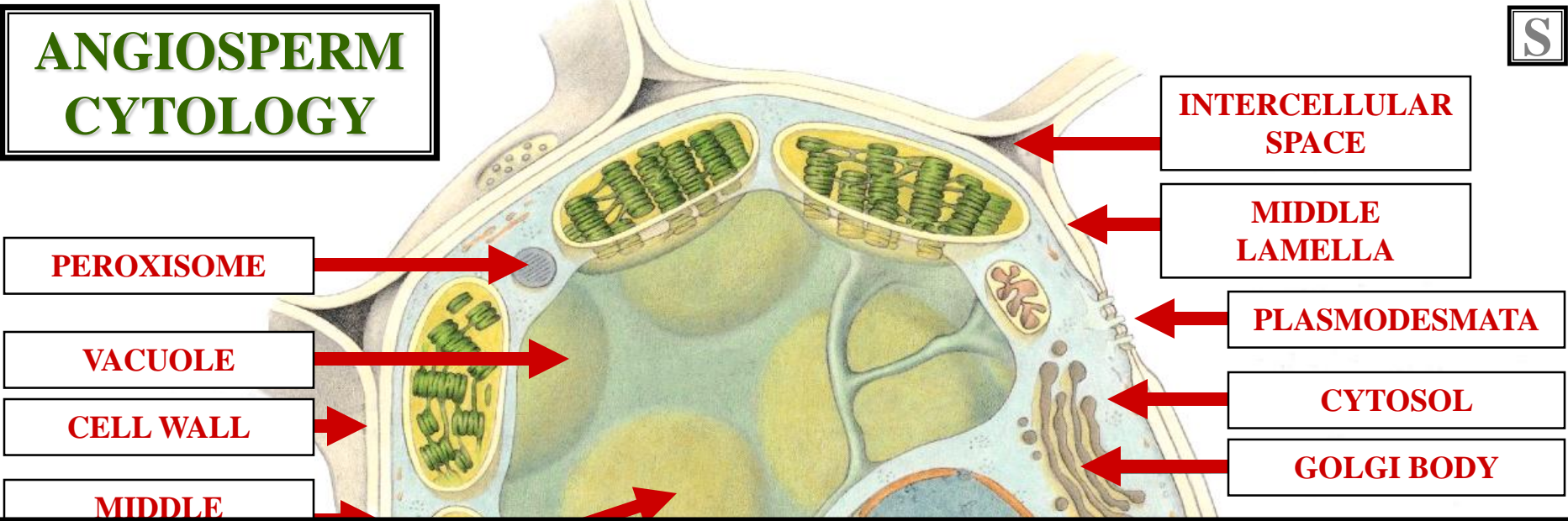
ANGIOSPERM CYTOLOGY



SUMMARY



ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

DOUBLE-MB ORGANELLES

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

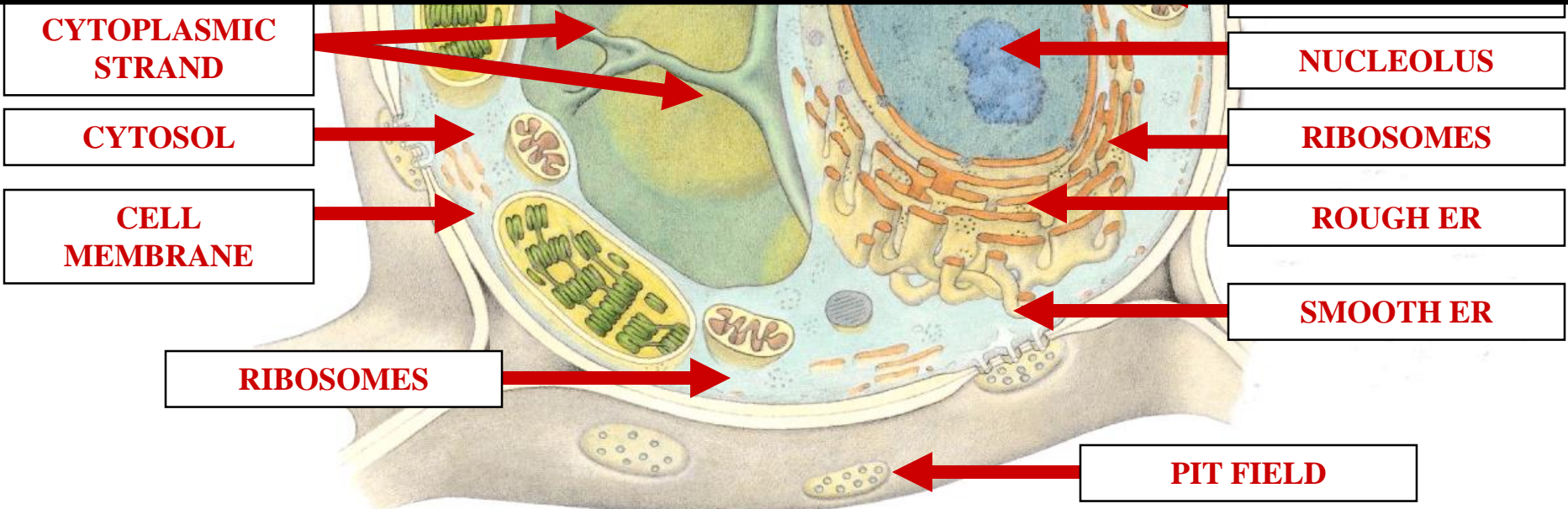
NUCLEOLUS

RIBOSOMES

ROUGH ER

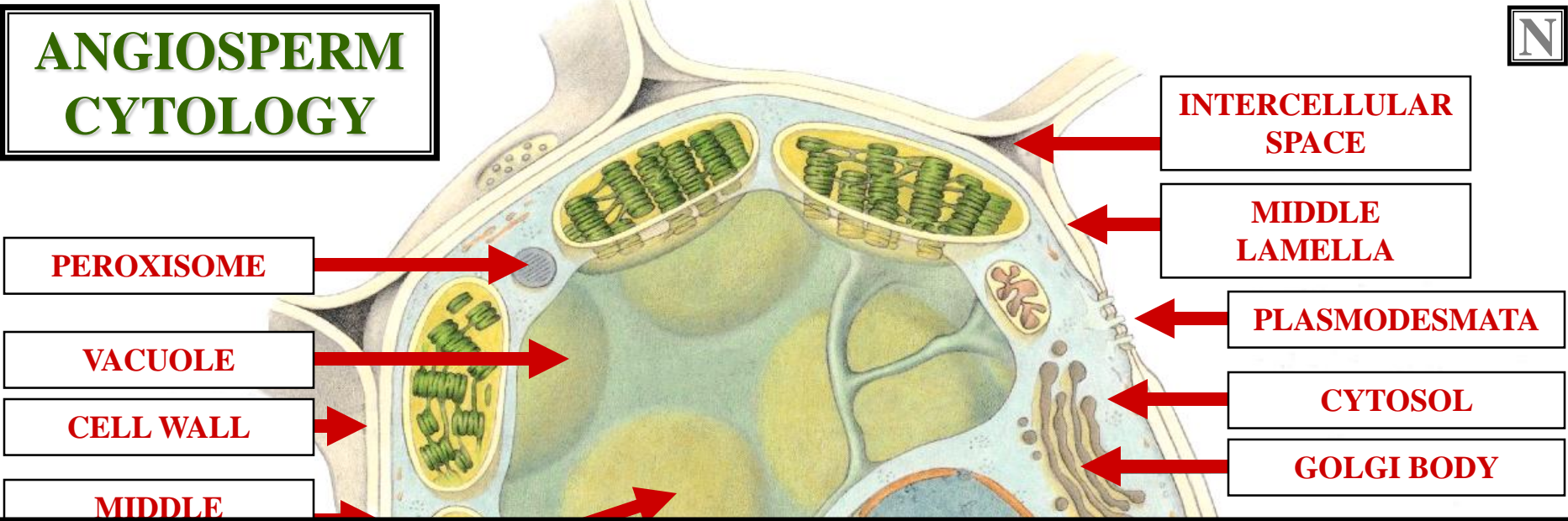
SMOOTH ER

PIT FIELD





ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

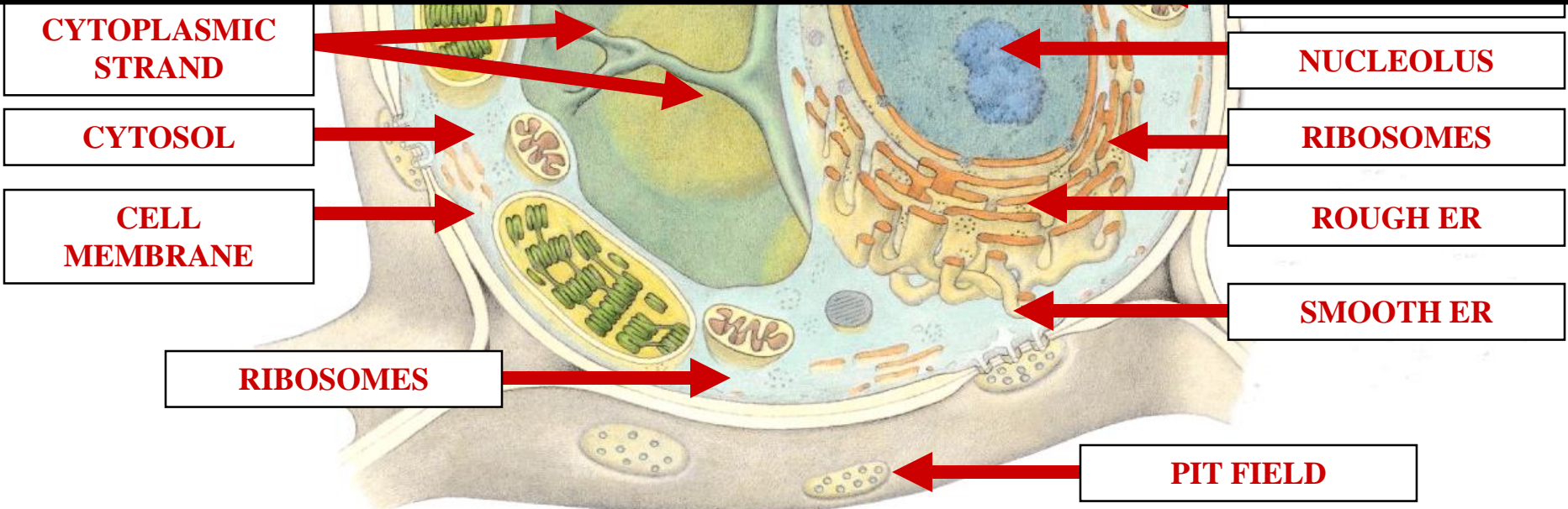
MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

SINGLE-MB ORGANELLES



CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

NUCLEOLUS

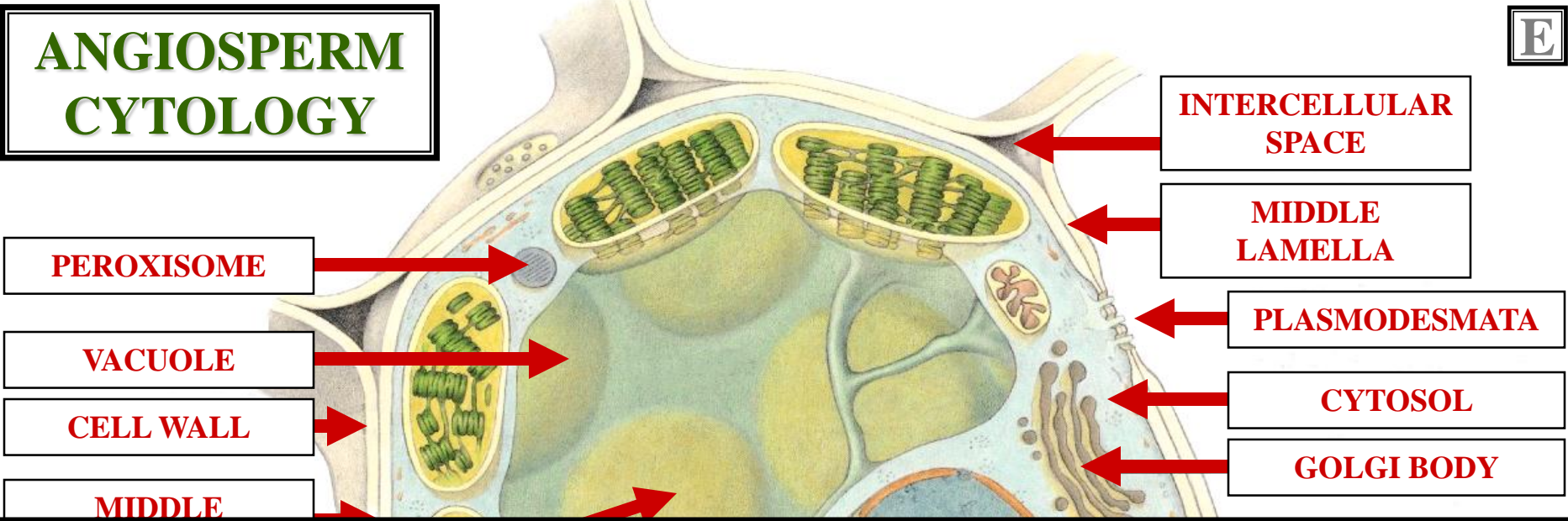
RIBOSOMES

ROUGH ER

SMOOTH ER

PIT FIELD

ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

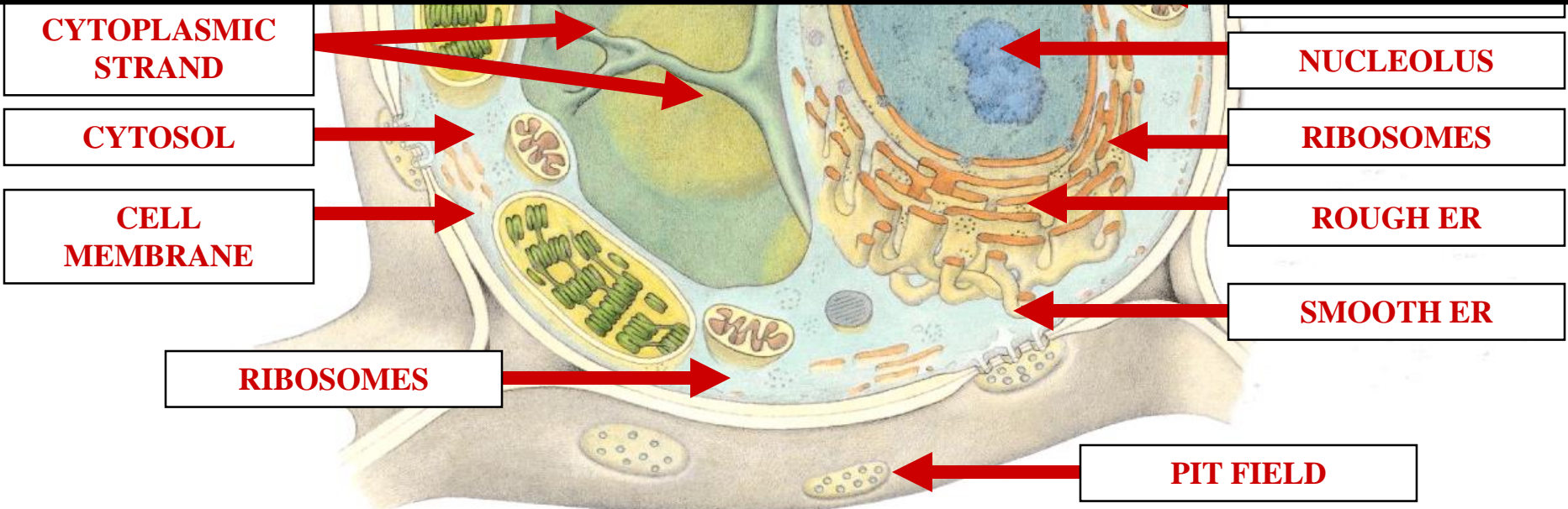
MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NON-MB ORGANELLE



CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

NUCLEOLUS

RIBOSOMES

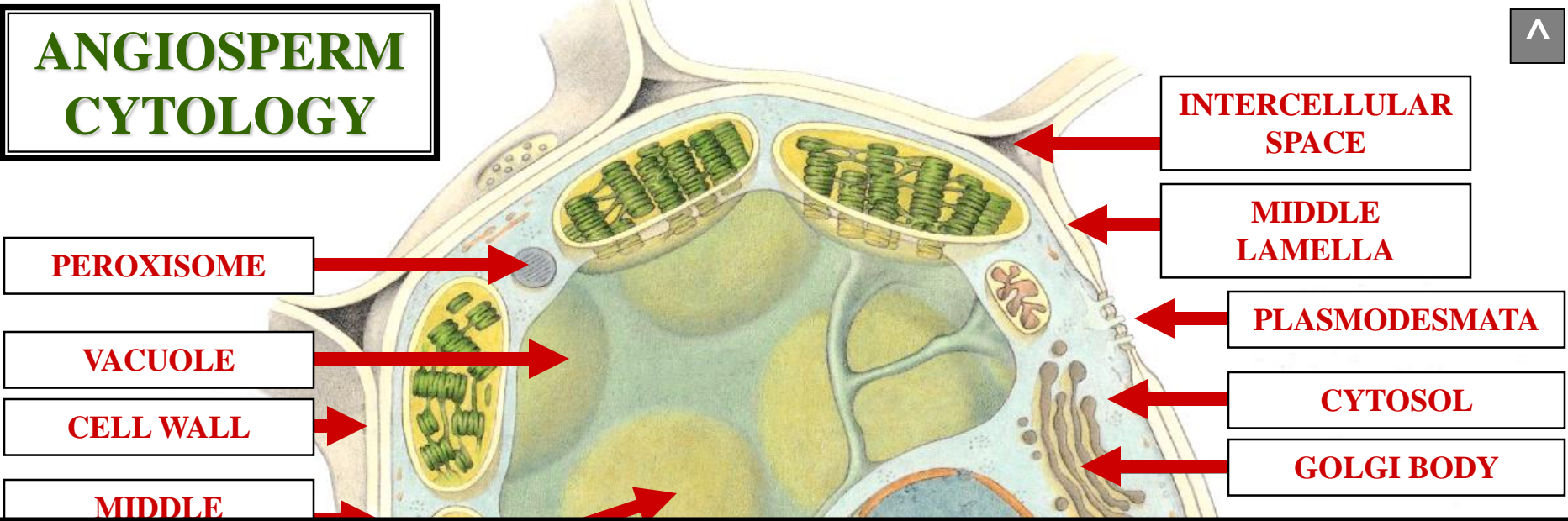
ROUGH ER

SMOOTH ER

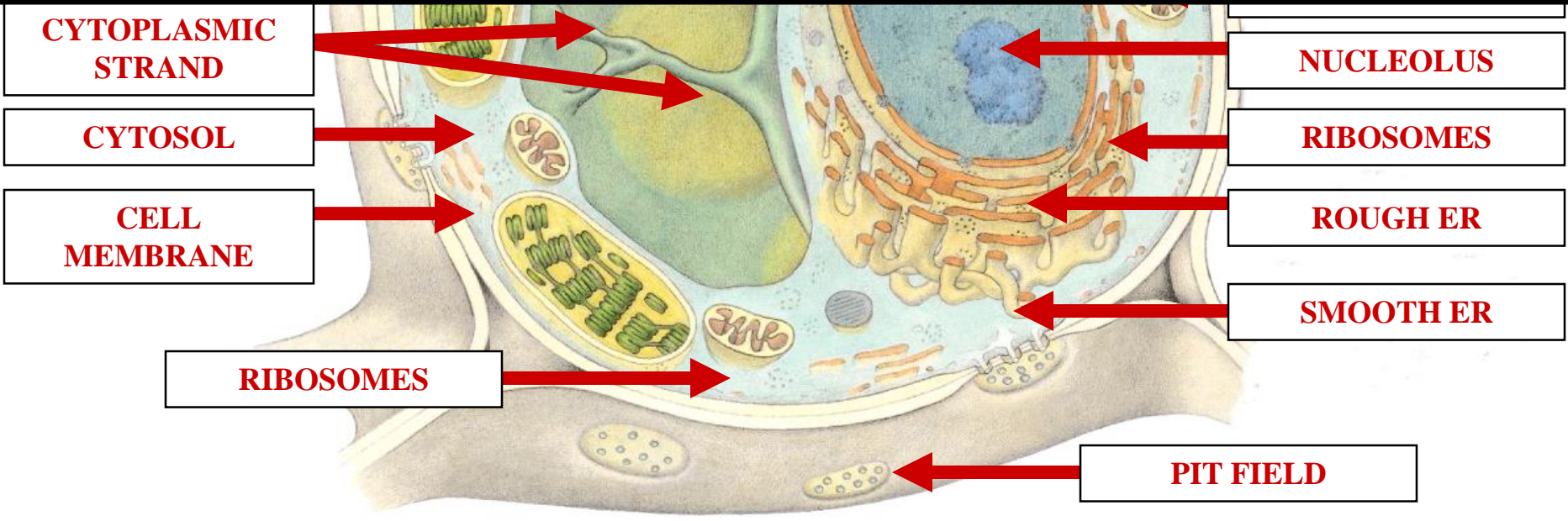
PIT FIELD



ANGIOSPERM CYTOLOGY



ENDO-MEMBRANE SYSTEM





ENDO-MEMBRANE SYSTEM

ENDO-MEMBRANE SYSTEM COMPONENTS

ENDO-MEMBRANE SYSTEM COMPONENTS

ENDOPLASMIC RETICULUM

ENDO-MEMBRANE SYSTEM COMPONENTS

ENDO-MEMBRANE SYSTEM

COMPONENTS

ENDOPLASMIC RETICULUM
GOLGI BODY

ENDO-MEMBRANE SYSTEM
COMPONENTS

ENDOPLASMIC RETICULUM ER

**ENDOPLASMIC
RETICULUM
ER**



ENDOPLASMIC RETICULUM

MEMBRANE DISTRIBUTED
THROUGHOUT CYTOSOL

ENDOPLASMIC RETICULUM



ENDOPLASMIC RETICULUM

TRANSPORT AND COMMUNICATION SYSTEM

ENDOPLASMIC RETICULUM

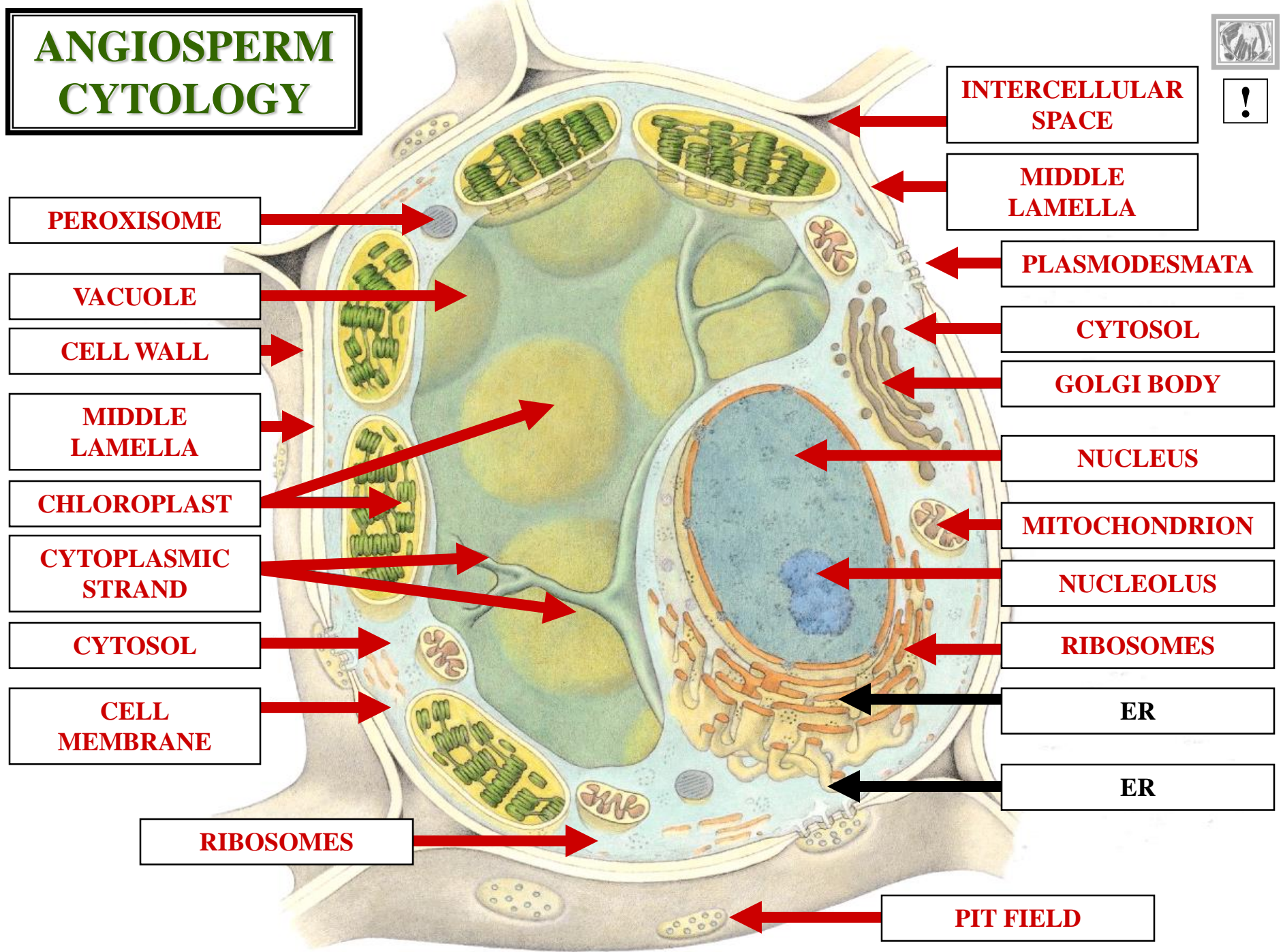


ENDOPLASMIC RETICULUM

ENZYME SYNTHESIS AND MEMBRANE SYNTHESIS

ENDOPLASMIC RETICULUM

ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE LAMELLA

CHLOROPLAST

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NUCLEUS

MITOCHONDRION

NUCLEOLUS

RIBOSOMES

ER

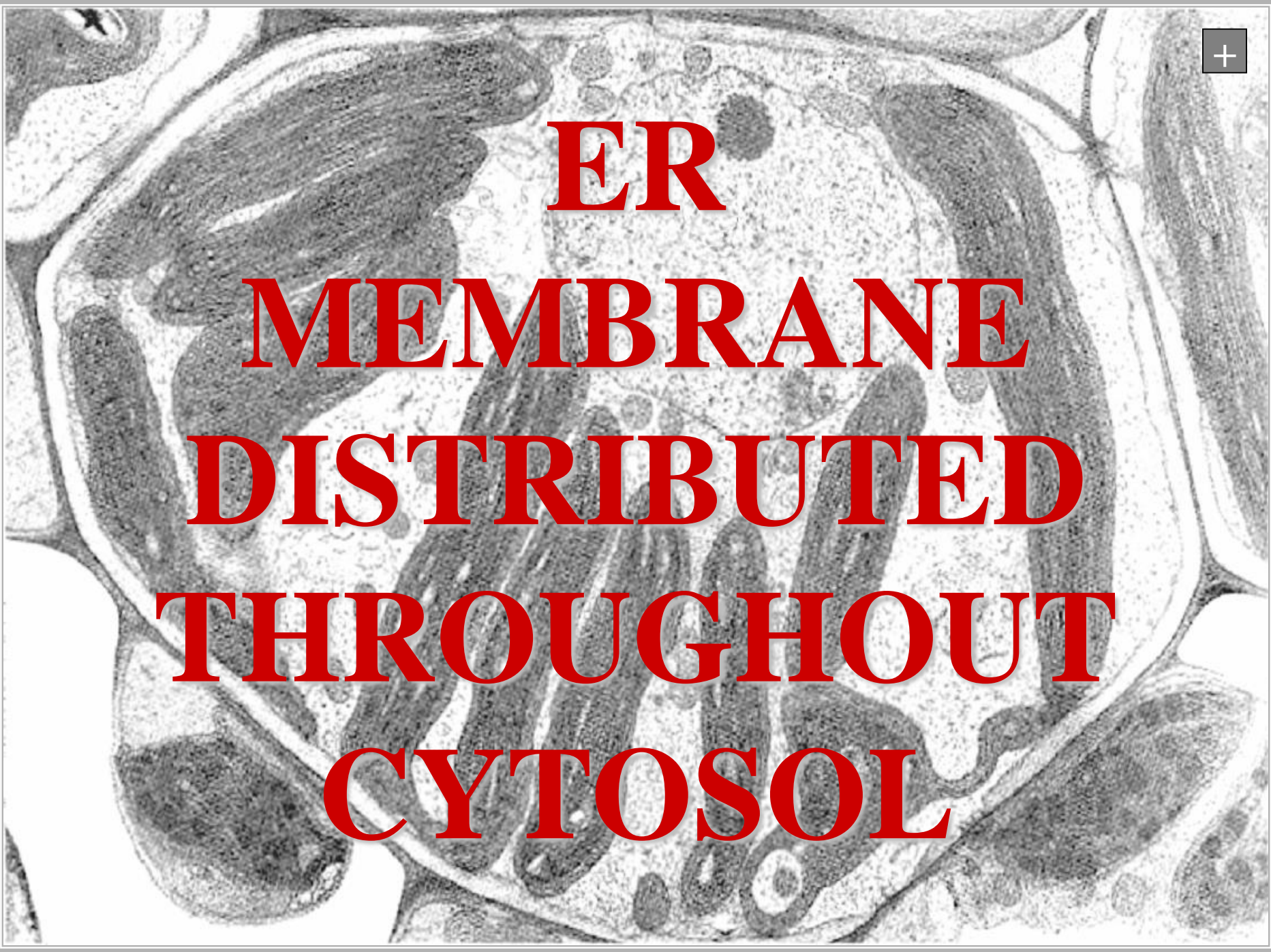
ER

PIT FIELD



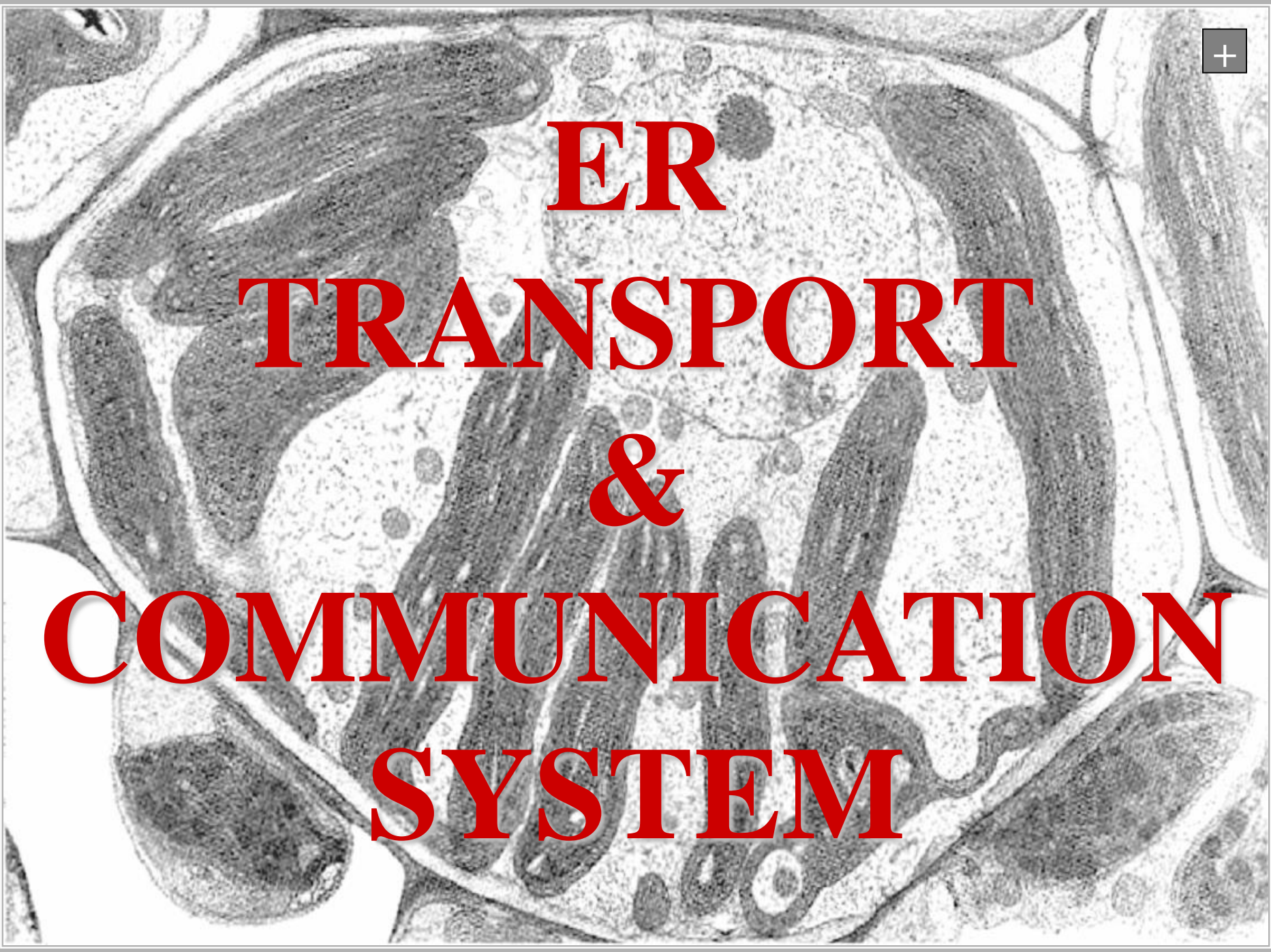


ER
MEMBRANE
DISTRIBUTED
THROUGHOUT
CYTOSOL





**ER
TRANSPORT
&
COMMUNICATION
SYSTEM**



An electron micrograph of a cell, likely a muscle cell, showing various organelles. The endoplasmic reticulum (ER) is visible as a network of membranes, and mitochondria are seen as elongated, striated structures. The text is overlaid in a large, bold, red serif font.

ER
ENZYME
SYNTHESIS
&
MEMBRANE
SYNTHESIS





ENDOPLASMIC RETICULUM

ULTRASTRUCTURE

ENDOPLASMIC RETICULUM ULTRASTRUCTURE COMPONENTS

**ENDOPLASMIC RETICULUM
ULTRASTRUCTURE
COMPONENTS**

ROUGH ER

**ENDOPLASMIC RETICULUM
ULTRASTRUCTURE
COMPONENTS**

ENDOPLASMIC RETICULUM R
ULTRASTRUCTURE
COMPONENTS

ROUGH ER
SMOOTH ER

ENDOPLASMIC RETICULUM
ULTRASTRUCTURE
COMPONENTS

ROUGH ER



ROUGH

ENDOPLASMIC RETICULUM

RIBOSOMES: PRESENT

ROUGH

ENDOPLASMIC RETICULUM



ROUGH

ENDOPLASMIC RETICULUM

RIBOSOMES: PRESENT

CONFLUENT WITH NUCLEUS

ROUGH

ENDOPLASMIC RETICULUM

ROUGH



ENDOPLASMIC RETICULUM

RIBOSOMES: PRESENT

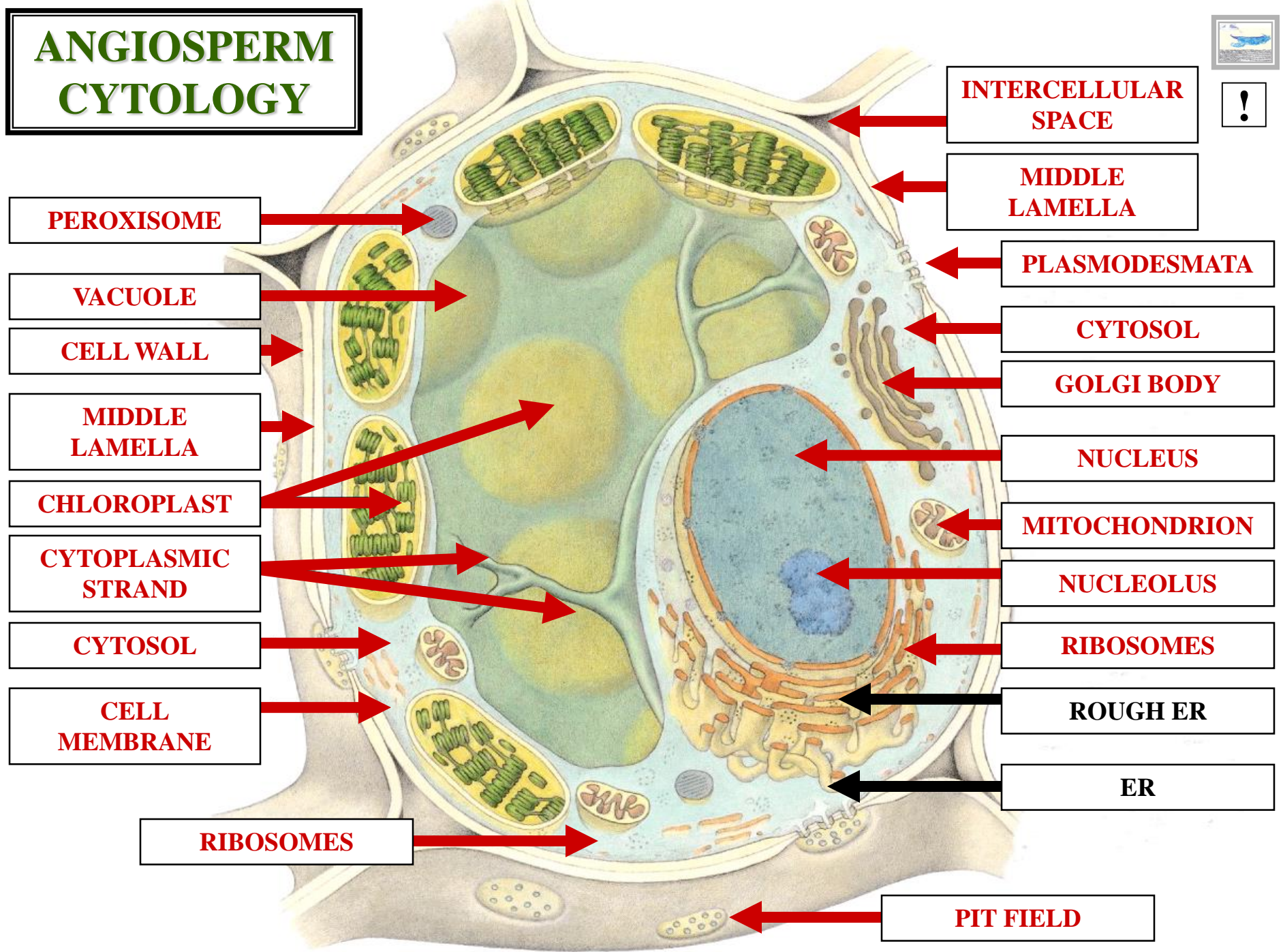
CONFLUENT WITH NUCLEUS

SITE: ENZYME SYNTHESIS

ROUGH

ENDOPLASMIC RETICULUM

ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE LAMELLA

CHLOROPLAST

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NUCLEUS

MITOCHONDRION

NUCLEOLUS

RIBOSOMES

ROUGH ER

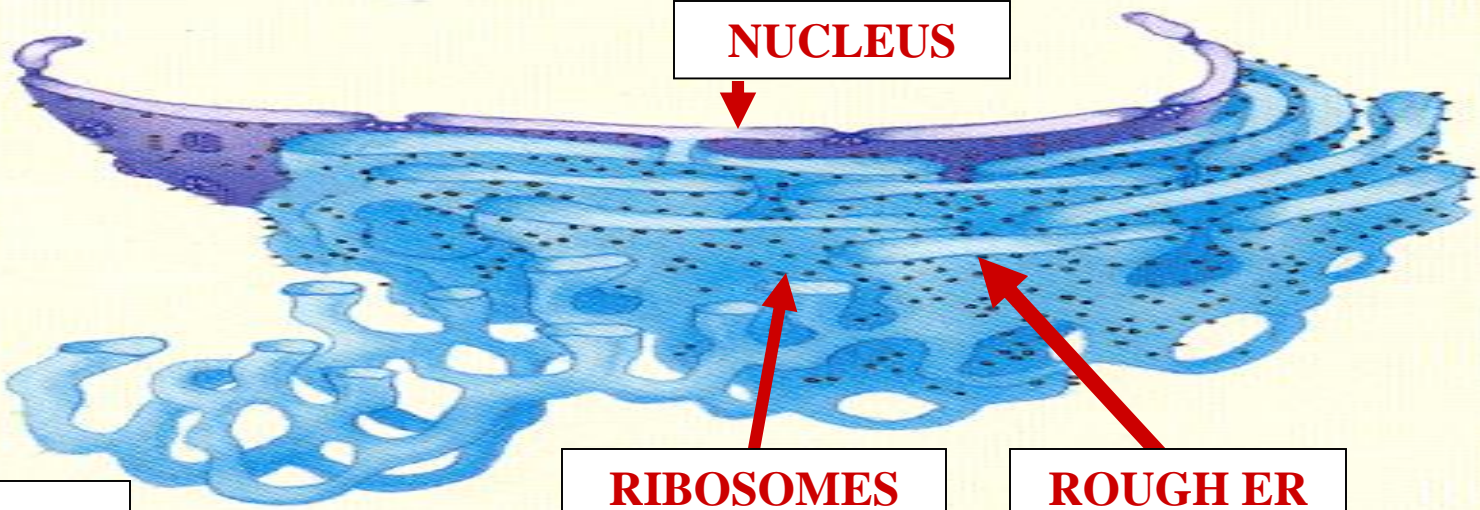
ER

PIT FIELD



ENDOPLASMIC RETICULUM ULTRASTRUCTURE

C

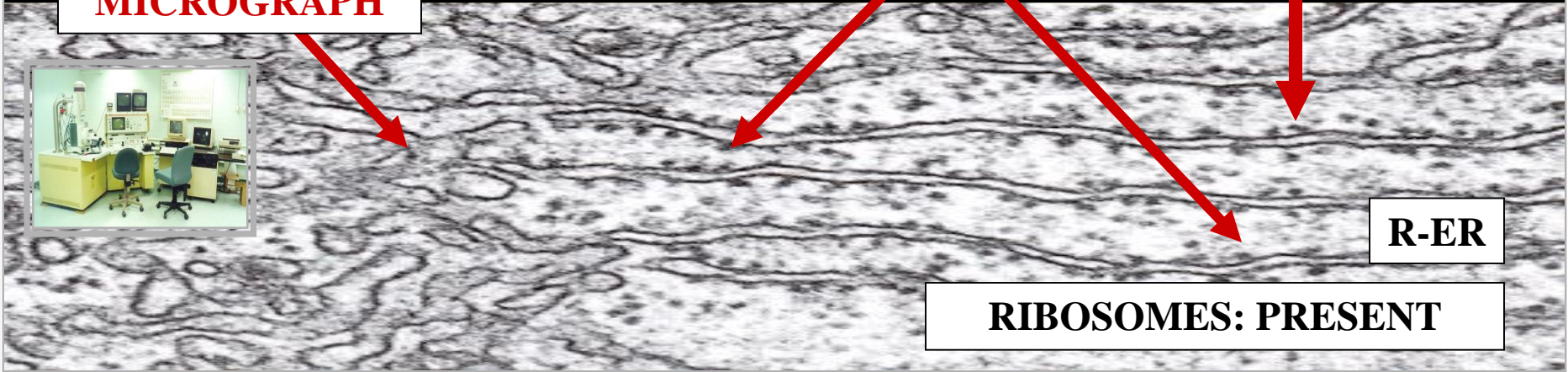


NUCLEUS

RIBOSOMES

ROUGH ER

**TEM
MICROGRAPH**

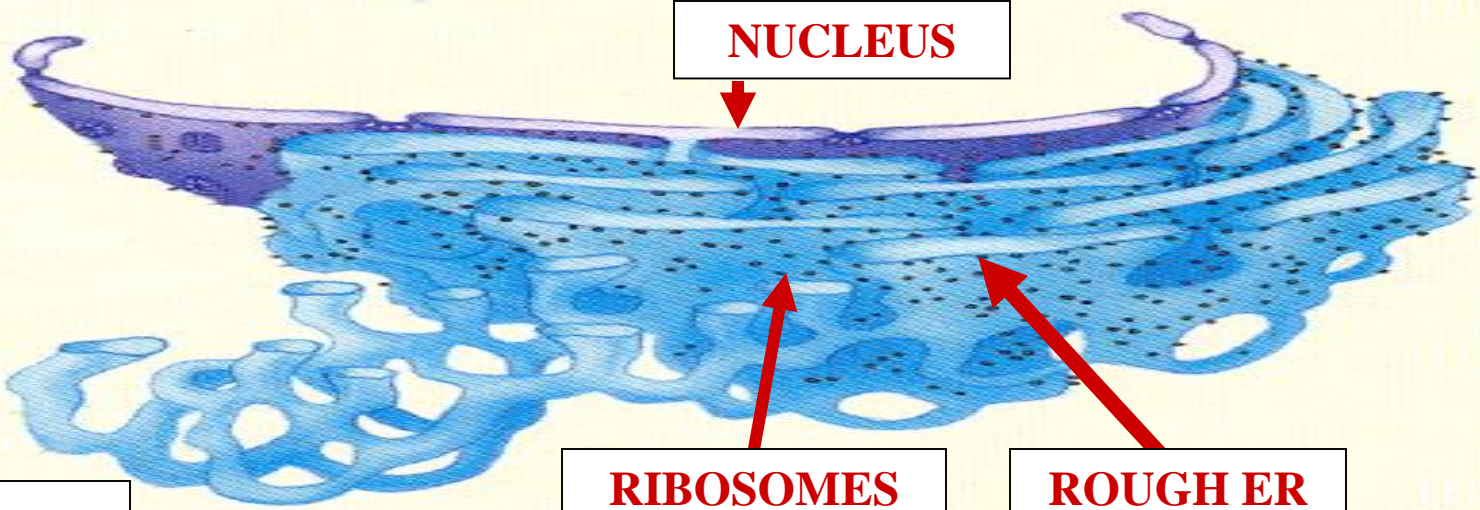


R-ER

RIBOSOMES: PRESENT

ENDOPLASMIC RETICULUM ULTRASTRUCTURE

S

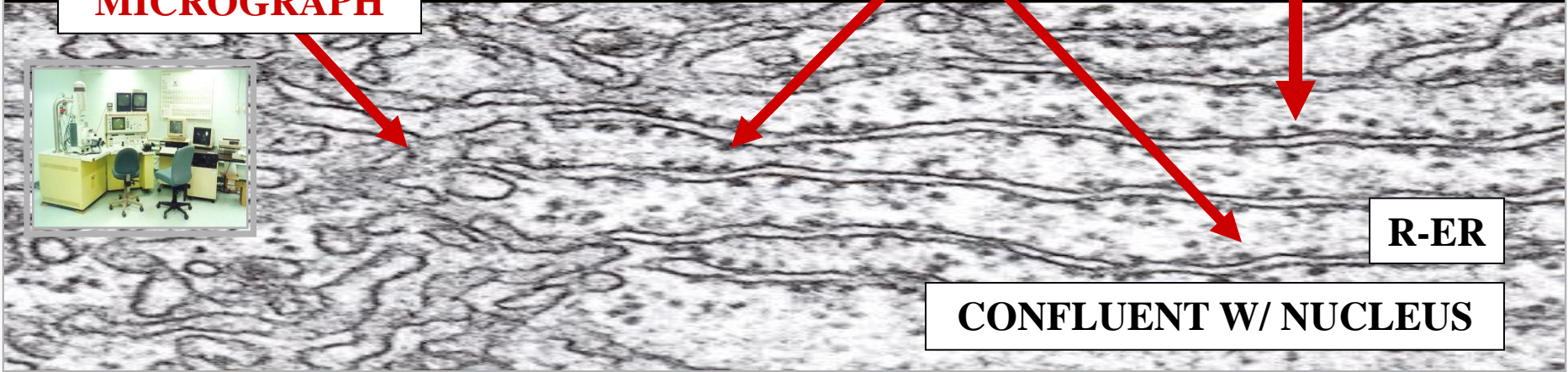


NUCLEUS

RIBOSOMES

ROUGH ER

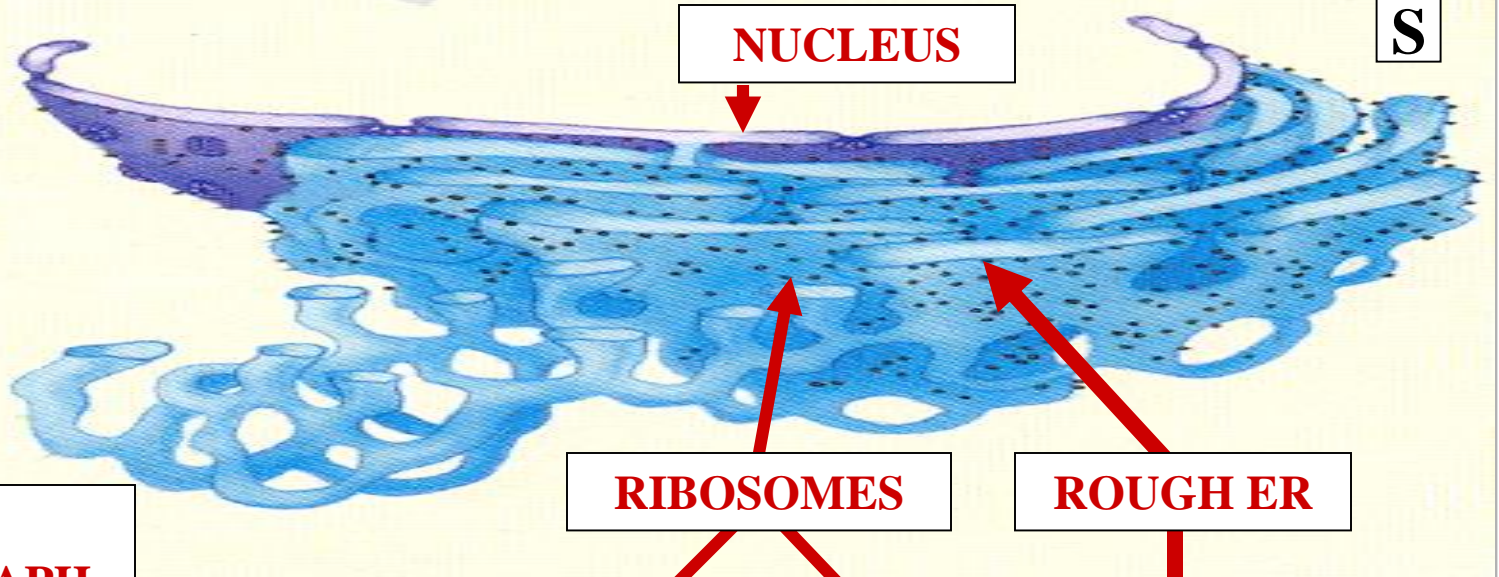
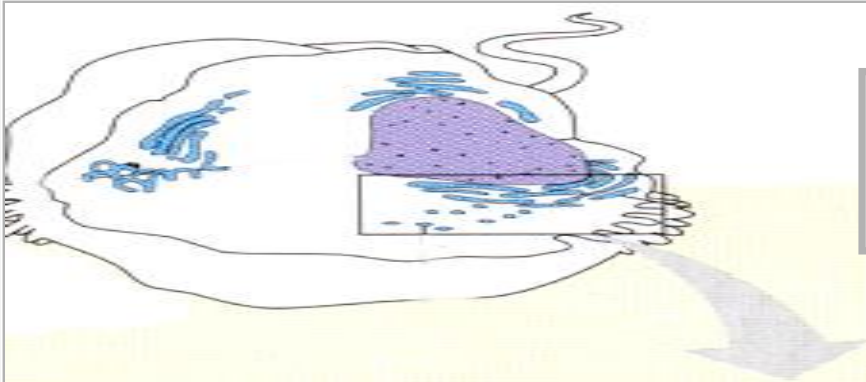
**TEM
MICROGRAPH**



R-ER

CONFLUENT W/ NUCLEUS

ENDOPLASMIC RETICULUM ULTRASTRUCTURE



NUCLEUS

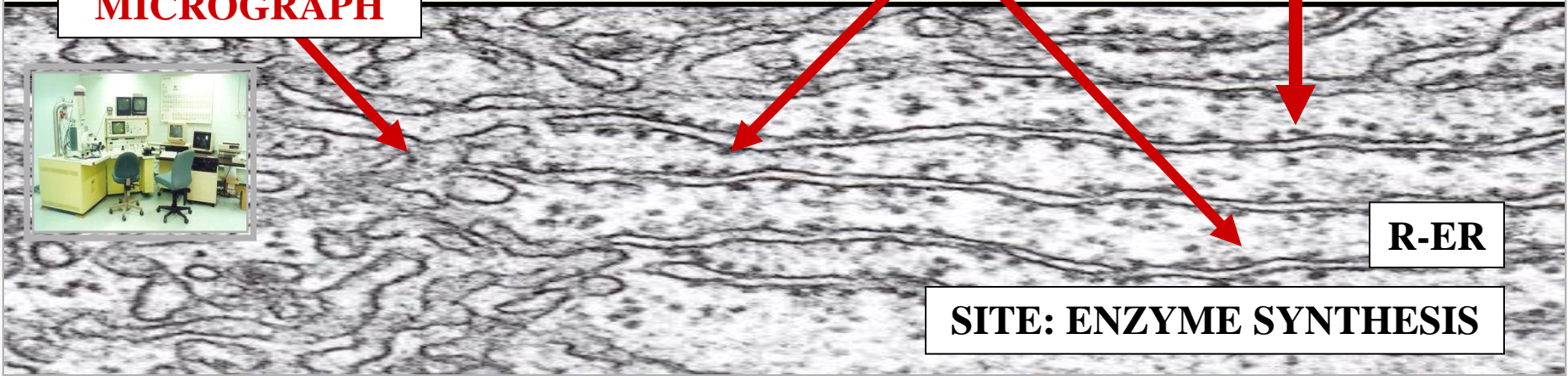
^

v

RIBOSOMES

ROUGH ER

**TEM
MICROGRAPH**



R-ER

SITE: ENZYME SYNTHESIS

SMOOTHER



SMOOTH
ENDOPLASMIC RETICULUM

RIBOSOMES: ABSENT

SMOOTH
ENDOPLASMIC RETICULUM



**SMOOTH
ENDOPLASMIC RETICULUM**

RIBOSOMES: ABSENT

CONFLUENT WITH R-ER

**SMOOTH
ENDOPLASMIC RETICULUM**



SMOOTH ENDOPLASMIC RETICULUM

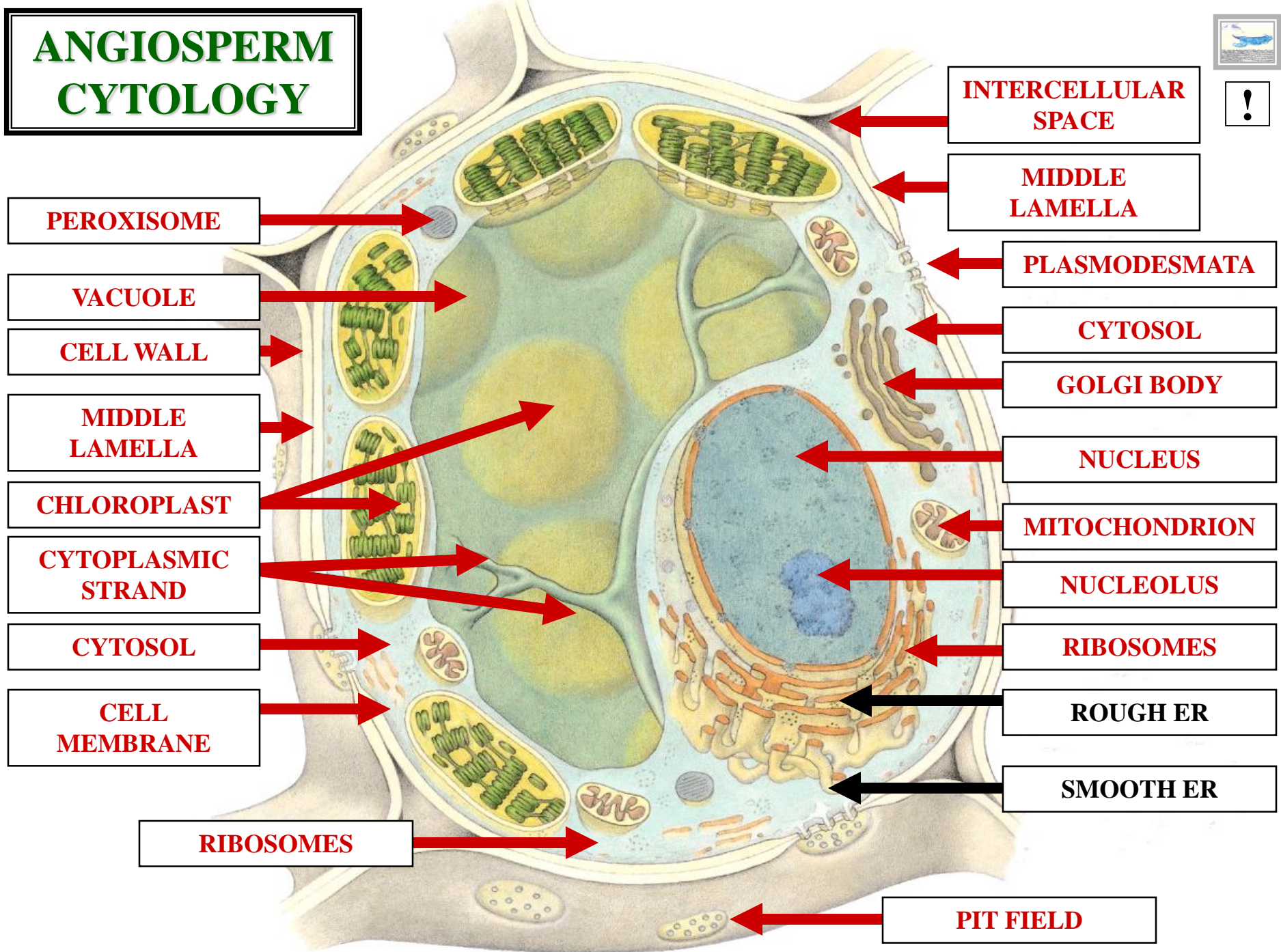
RIBOSOMES: ABSENT

CONFLUENT WITH R-ER

SITE: MEMBRANE SYNTHESIS

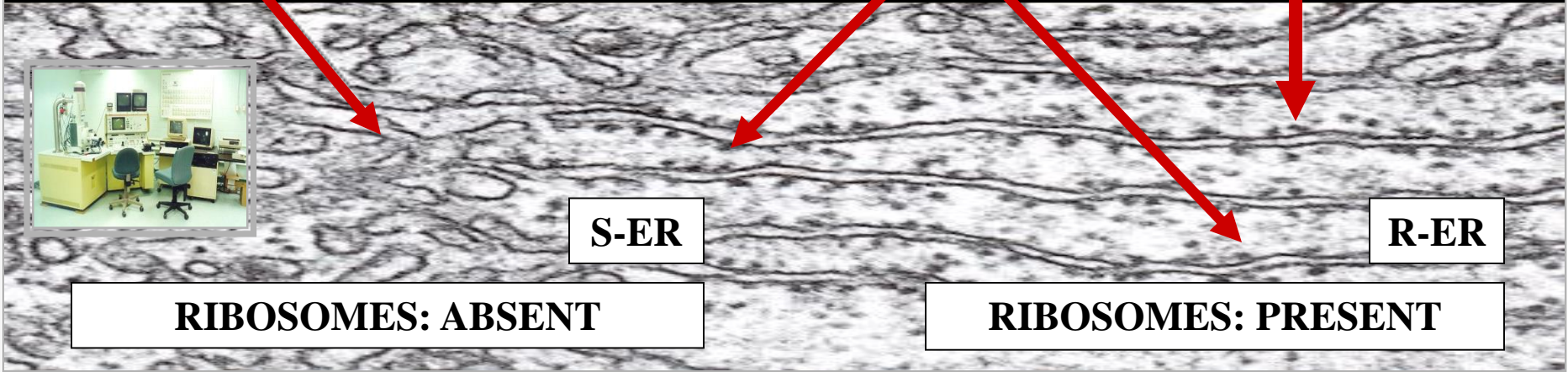
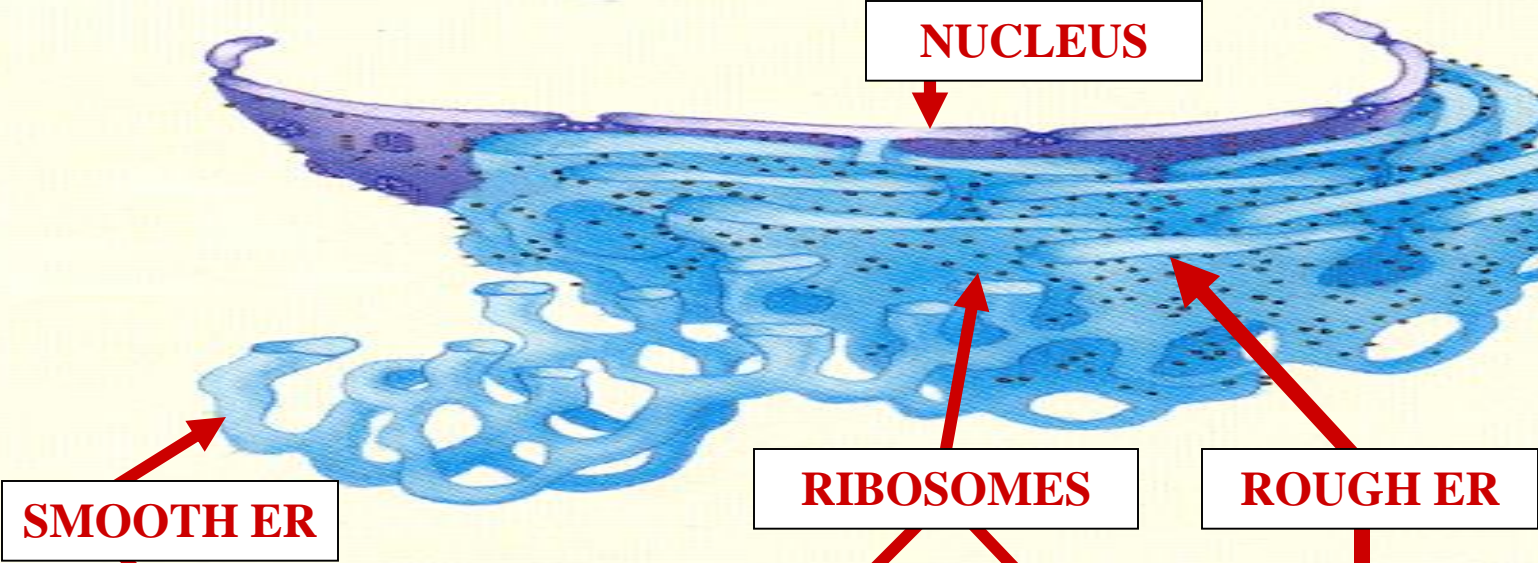
SMOOTH ENDOPLASMIC RETICULUM

ANGIOSPERM CYTOLOGY



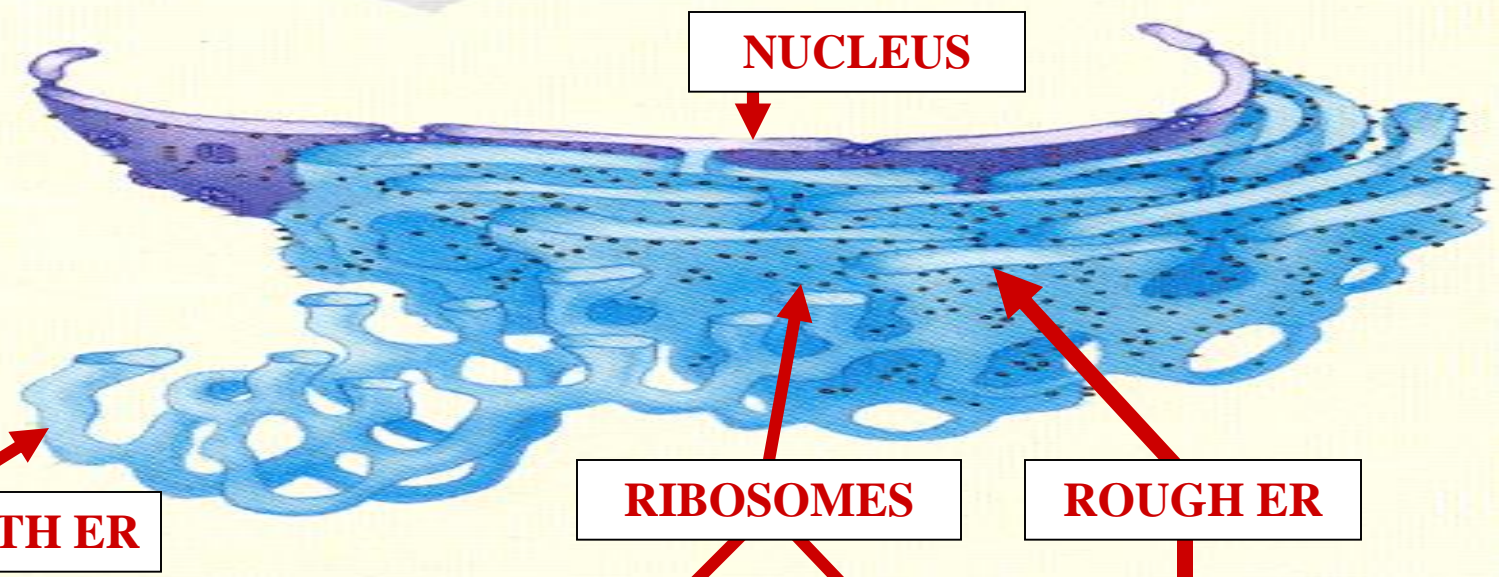
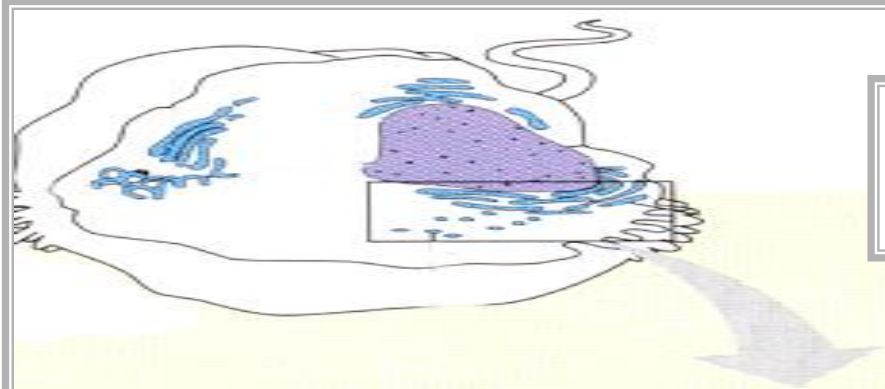
ENDOPLASMIC RETICULUM ULTRASTRUCTURE

C



ENDOPLASMIC RETICULUM ULTRASTRUCTURE

S



NUCLEUS

SMOOTH ER

RIBOSOMES

ROUGH ER

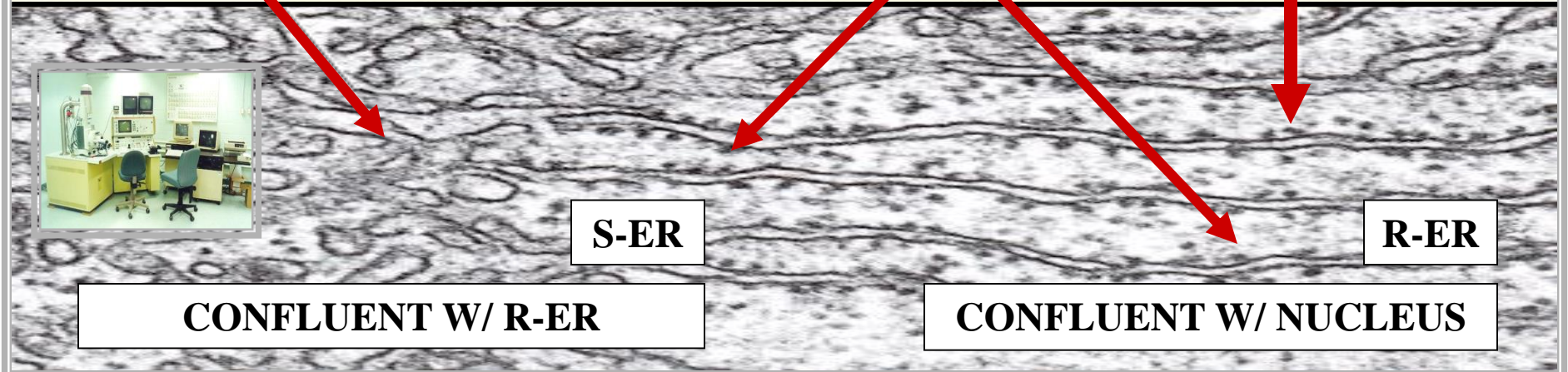


S-ER

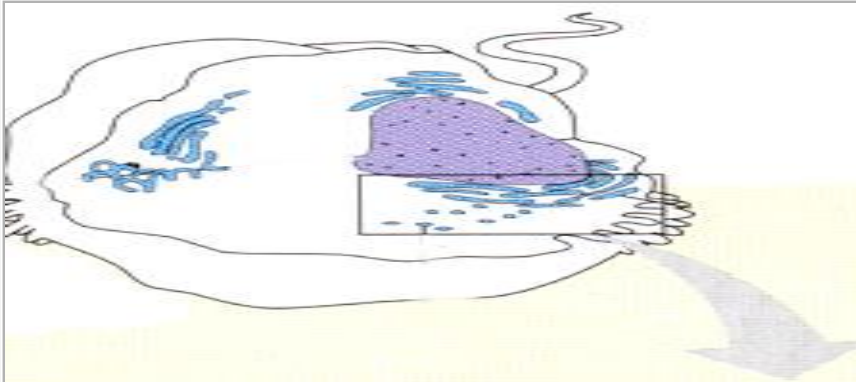
R-ER

CONFLUENT W/ R-ER

CONFLUENT W/ NUCLEUS



ENDOPLASMIC RETICULUM ULTRASTRUCTURE



S
!

NUCLEUS

SMOOTH ER

RIBOSOMES

ROUGH ER

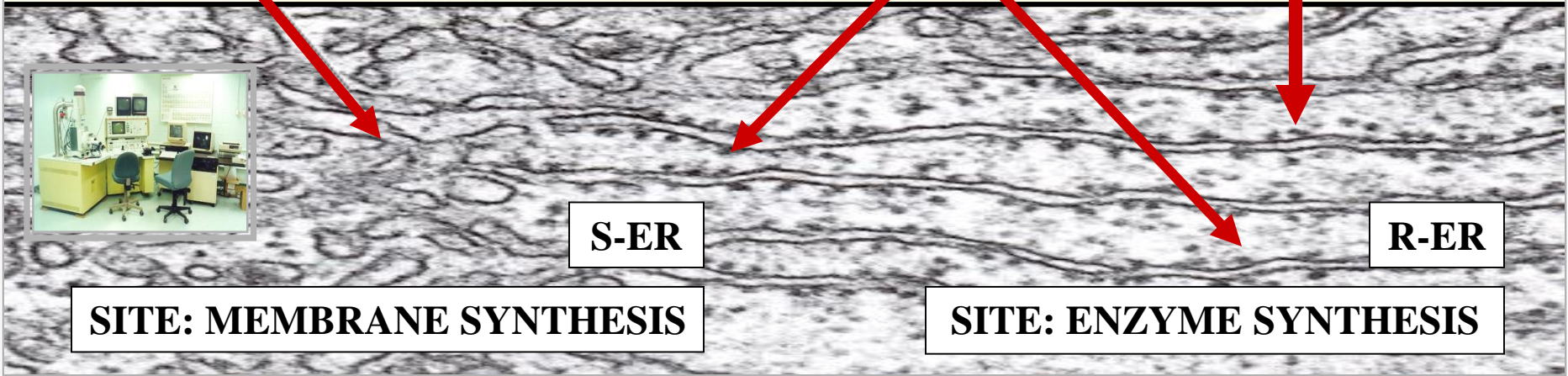


S-ER

R-ER

SITE: MEMBRANE SYNTHESIS

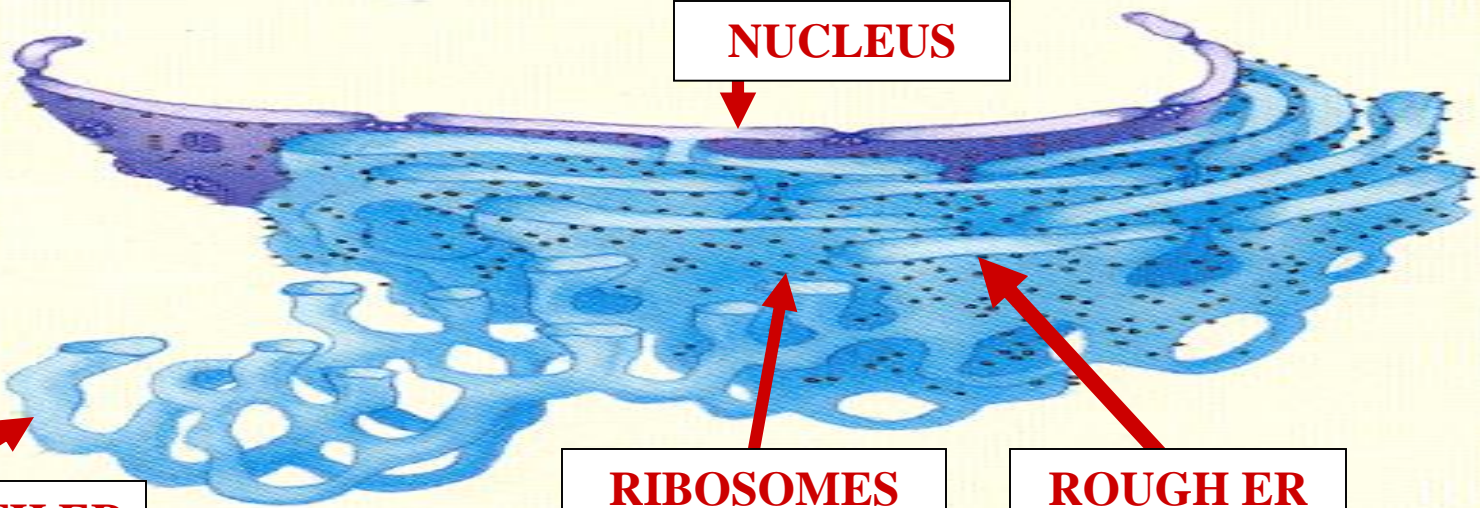
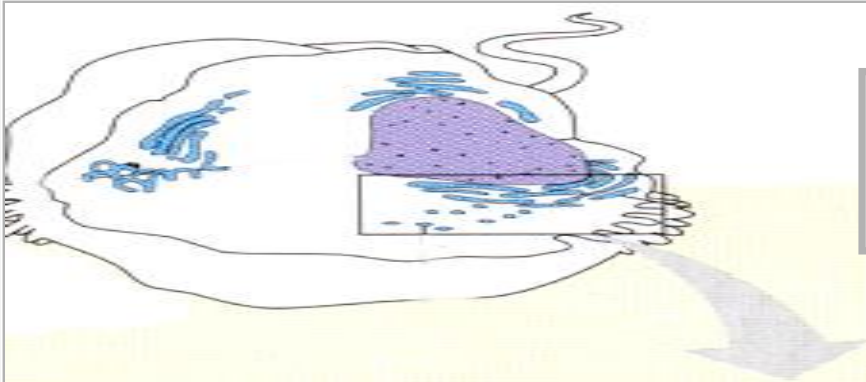
SITE: ENZYME SYNTHESIS





ENDOPLASMIC RETICULUM ULTRASTRUCTURE SUMMARY

ENDOPLASMIC RETICULUM ULTRASTRUCTURE



SMOOTH ER

RIBOSOMES

ROUGH ER

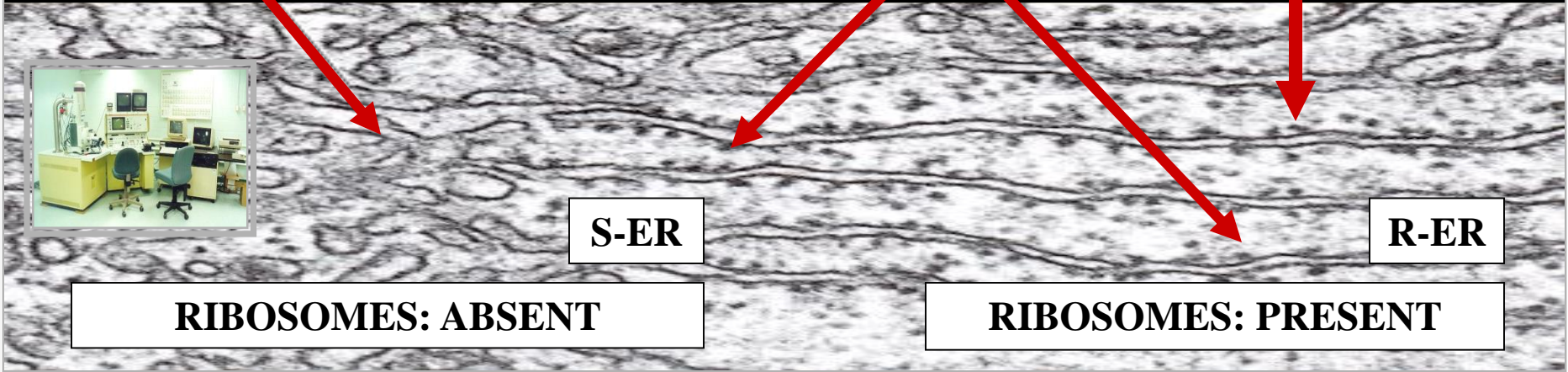


S-ER

R-ER

RIBOSOMES: ABSENT

RIBOSOMES: PRESENT



GOLGI BODY

GOLGI BODY

GOLGI BODY



**ER DRIVED
VESICLE ASSEMBLAGE**

GOLGI BODY

GOLGI BODY

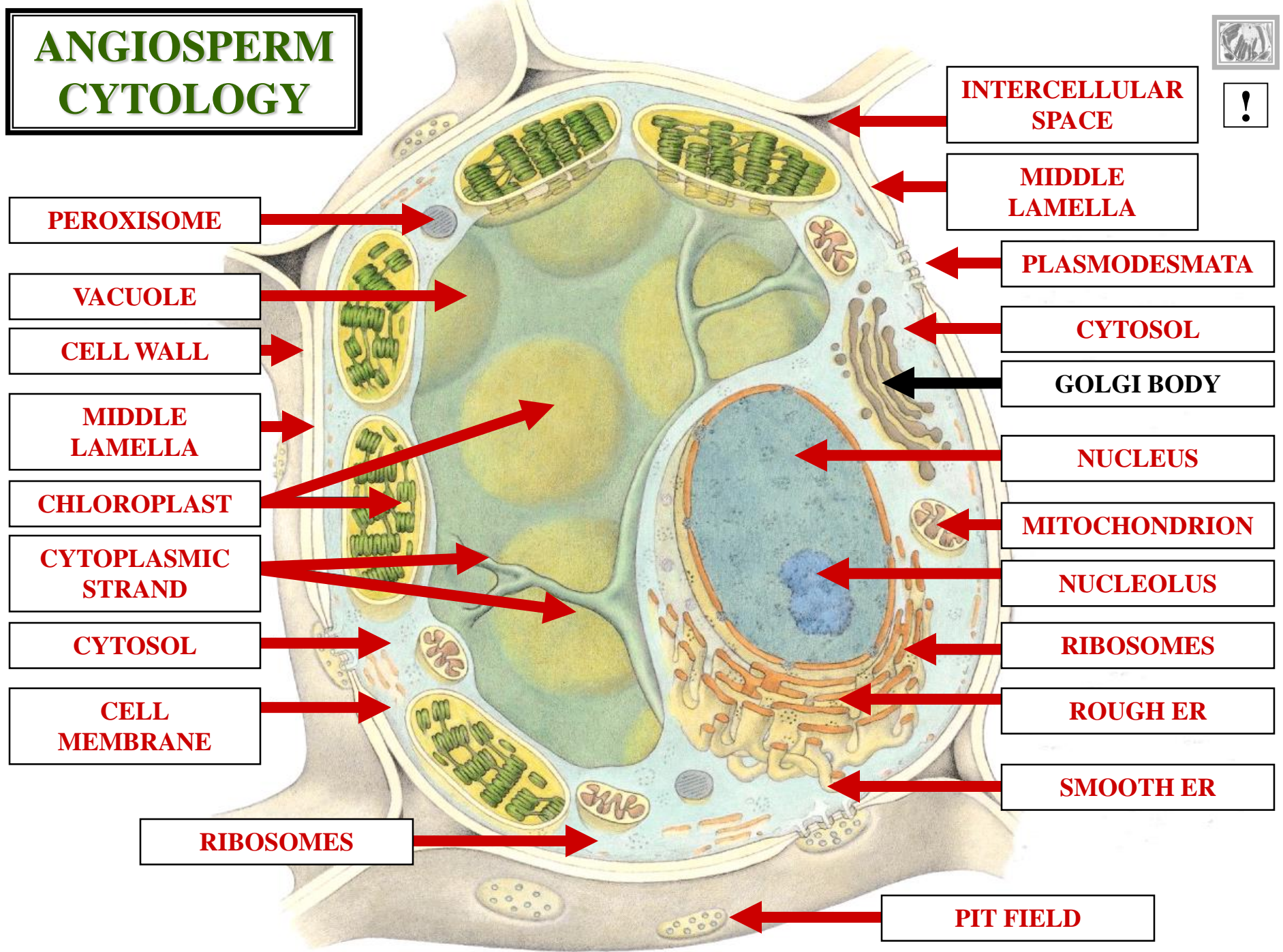


**ENERGICALLY DRIVEN
VESICLE ASSEMBLAGE**

**PACKAGING CENTER
FOR CELL EXIT**

GOLGI BODY

ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE LAMELLA

CHLOROPLAST

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NUCLEUS

MITOCHONDRION

NUCLEOLUS

RIBOSOMES

ROUGH ER

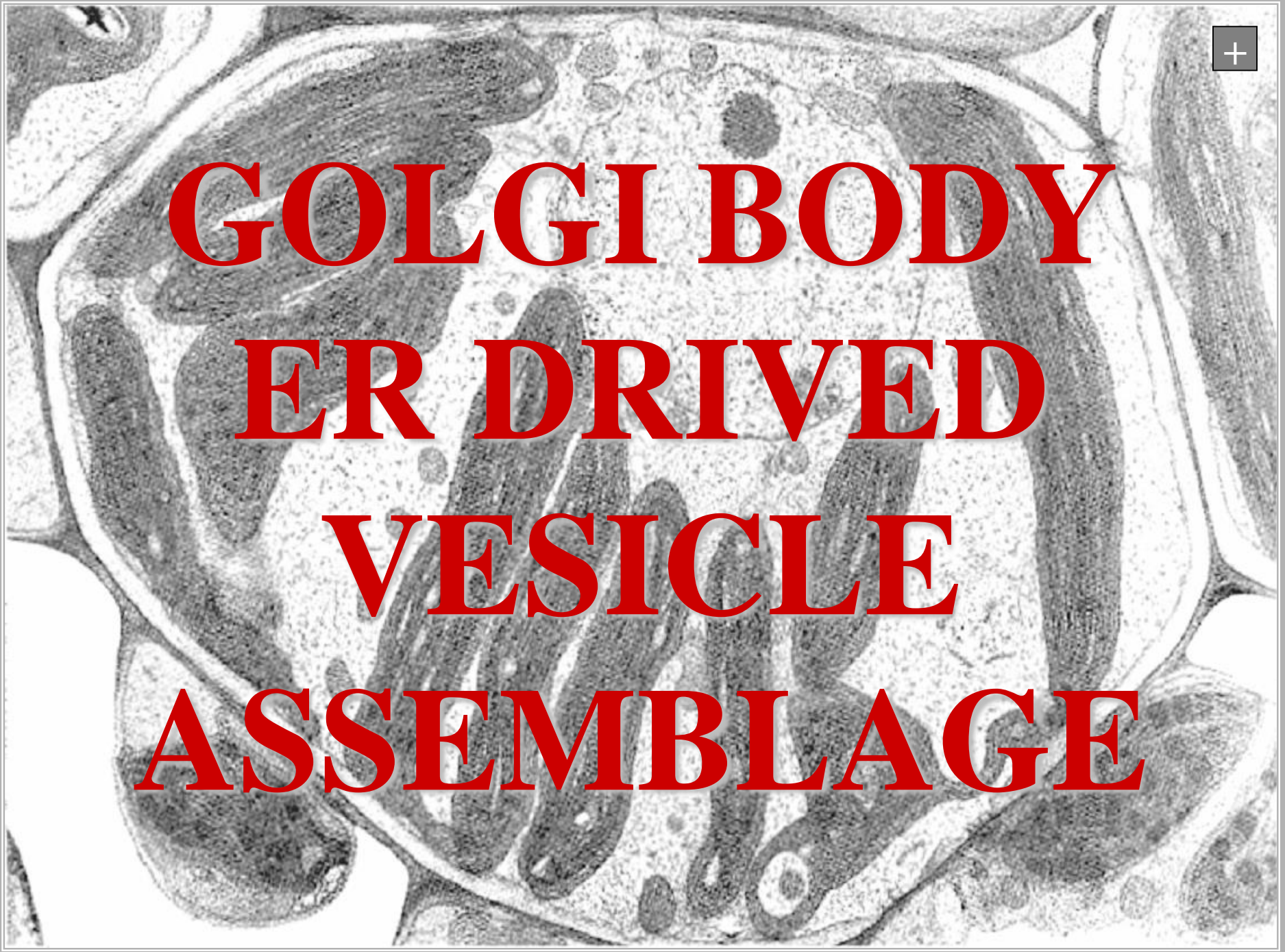
SMOOTH ER

PIT FIELD





**GOLGI BODY
ER DRIVEN
VESICLE
ASSEMBLAGE**





**GOLGI BODY
PLANT CELL
PACKAGING
CENTER
CELL EXIT**





GOLGI BODY

ULTRASTRUCTURE

ER

GOLGI ULTRASTRUCTURE

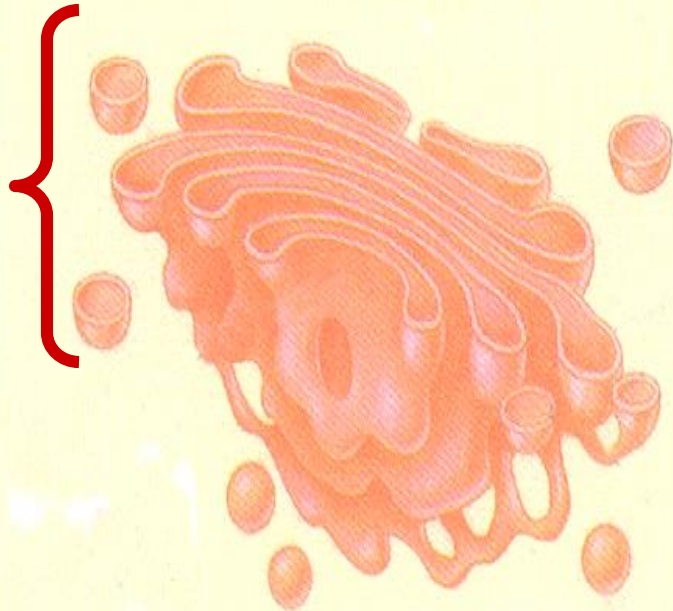


GOLGI BODY

GOLGI BODY



**GOLGI
BODY**



1 μ m

CM

GOLGI ULTRASTRUCTURE



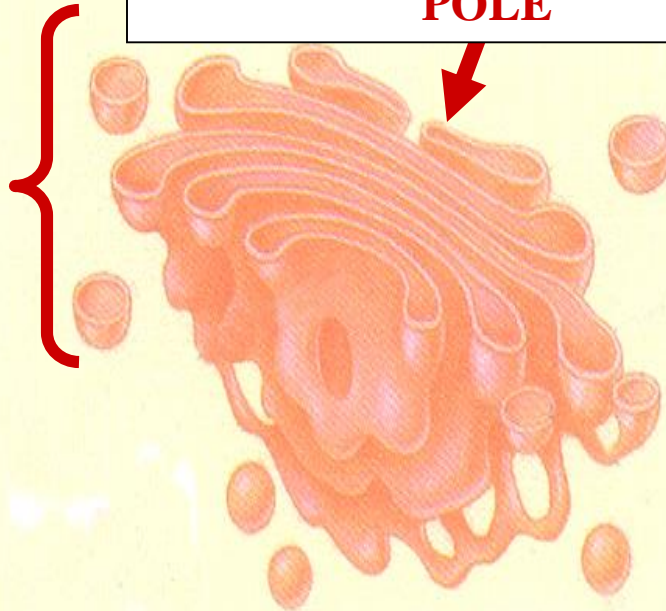
GOLGI BODY

GOLGI BODY



**GOLGI
ENDOPLASMIC RETICULUM
POLE**

**GOLGI
BODY**



1 μ m

EG

GOLGI ULTRASTRUCTURE



GOLGI BODY

GOLGI BODY



**GOLGI
ENDOPLASMIC RETICULUM
POLE**

**GOLGI
BODY**

**GOLGI
CELL MEMBRANE
POLE**

1 μ m



GOLGI BODY
PACKAGING CENTER
CELL EXIT
EXAMPLE



ENDOPLASMIC RETICULUM





ENDOPLASMIC RETICULUM

**ENDOPLASMIC RETICULUM
VESICLES**





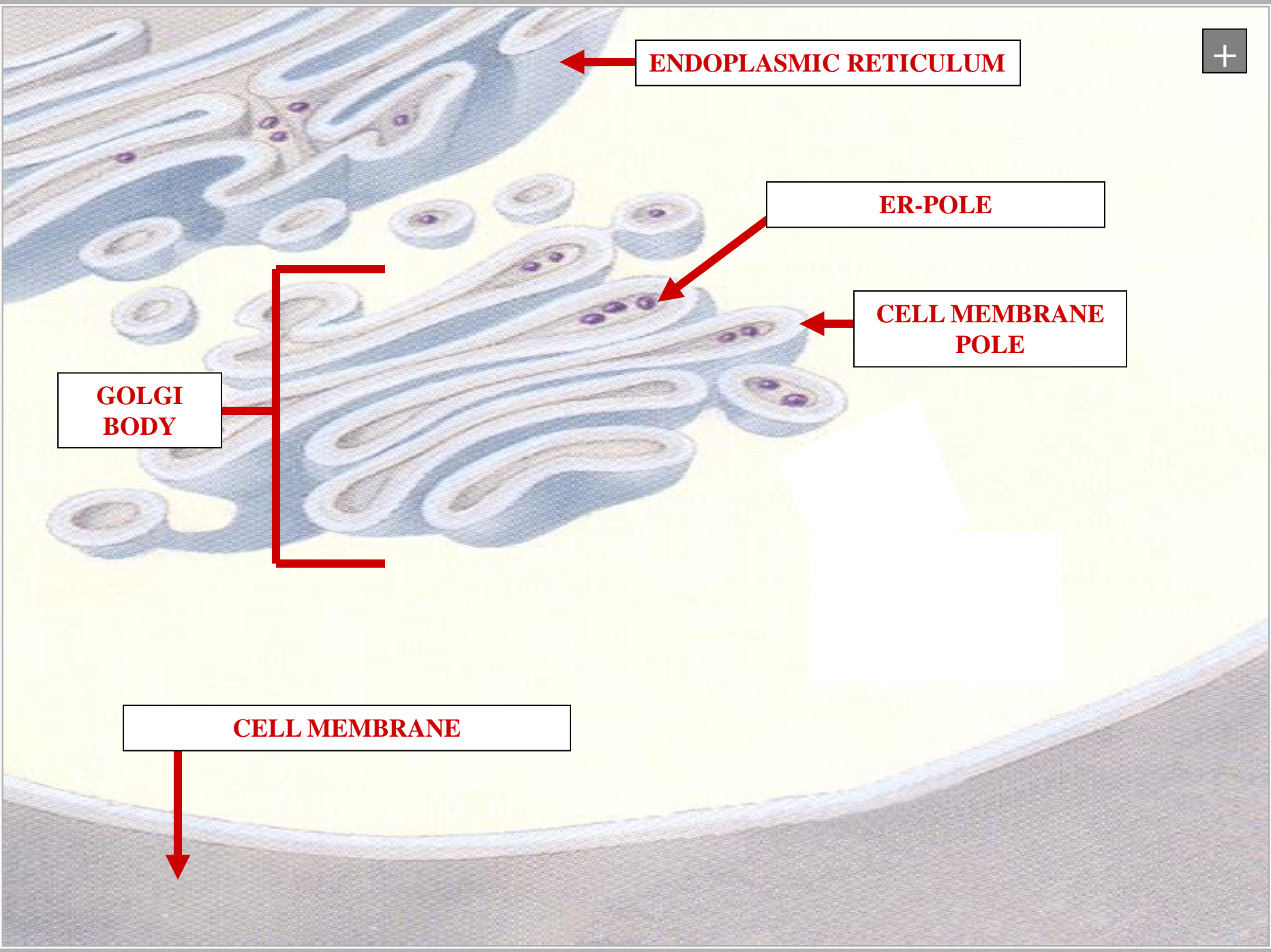
ENDOPLASMIC RETICULUM

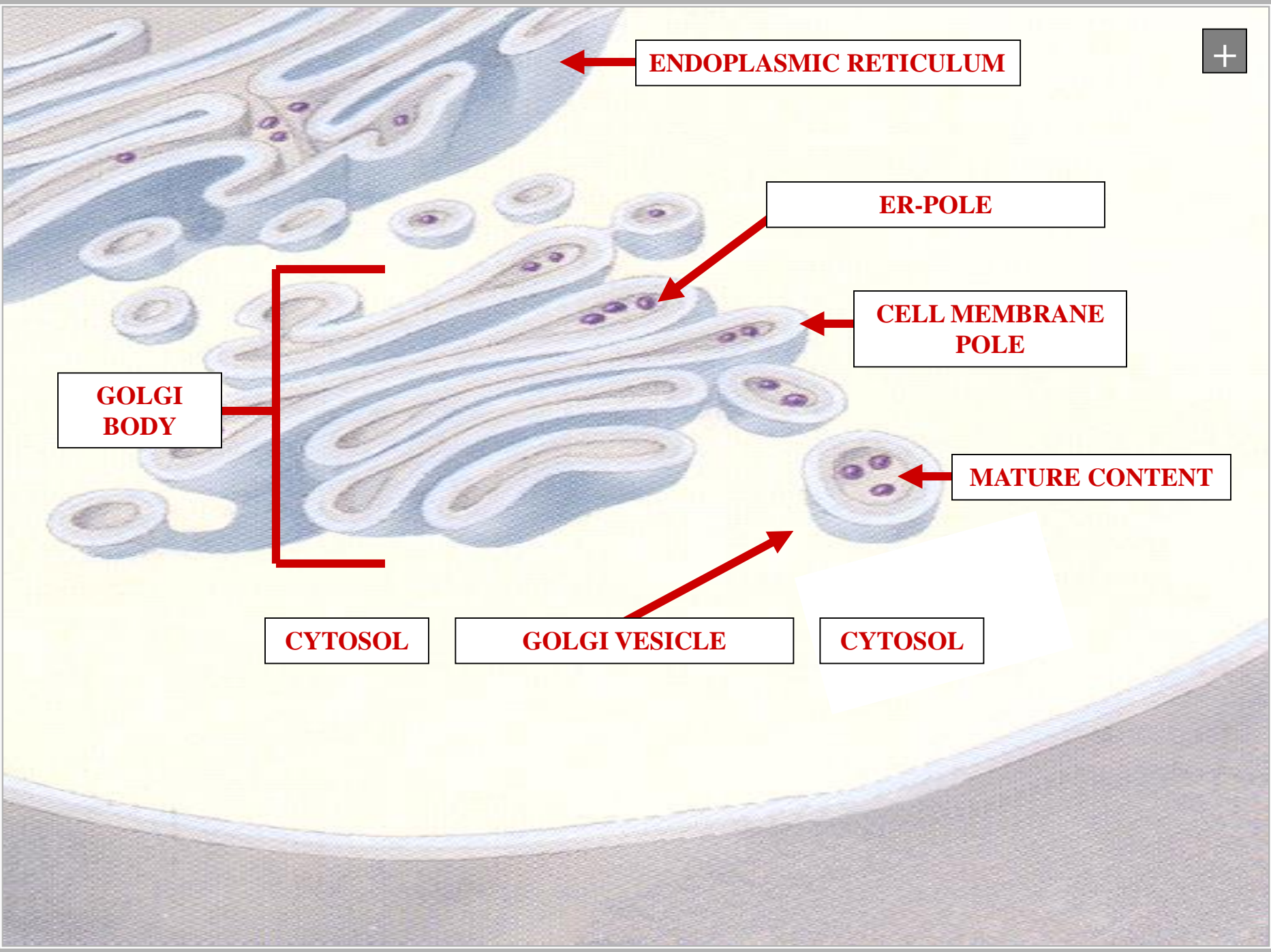
ER-POLE

**CELL MEMBRANE
POLE**

**GOLGI
BODY**

CELL MEMBRANE





ENDOPLASMIC RETICULUM

ER-POLE

**CELL MEMBRANE
POLE**

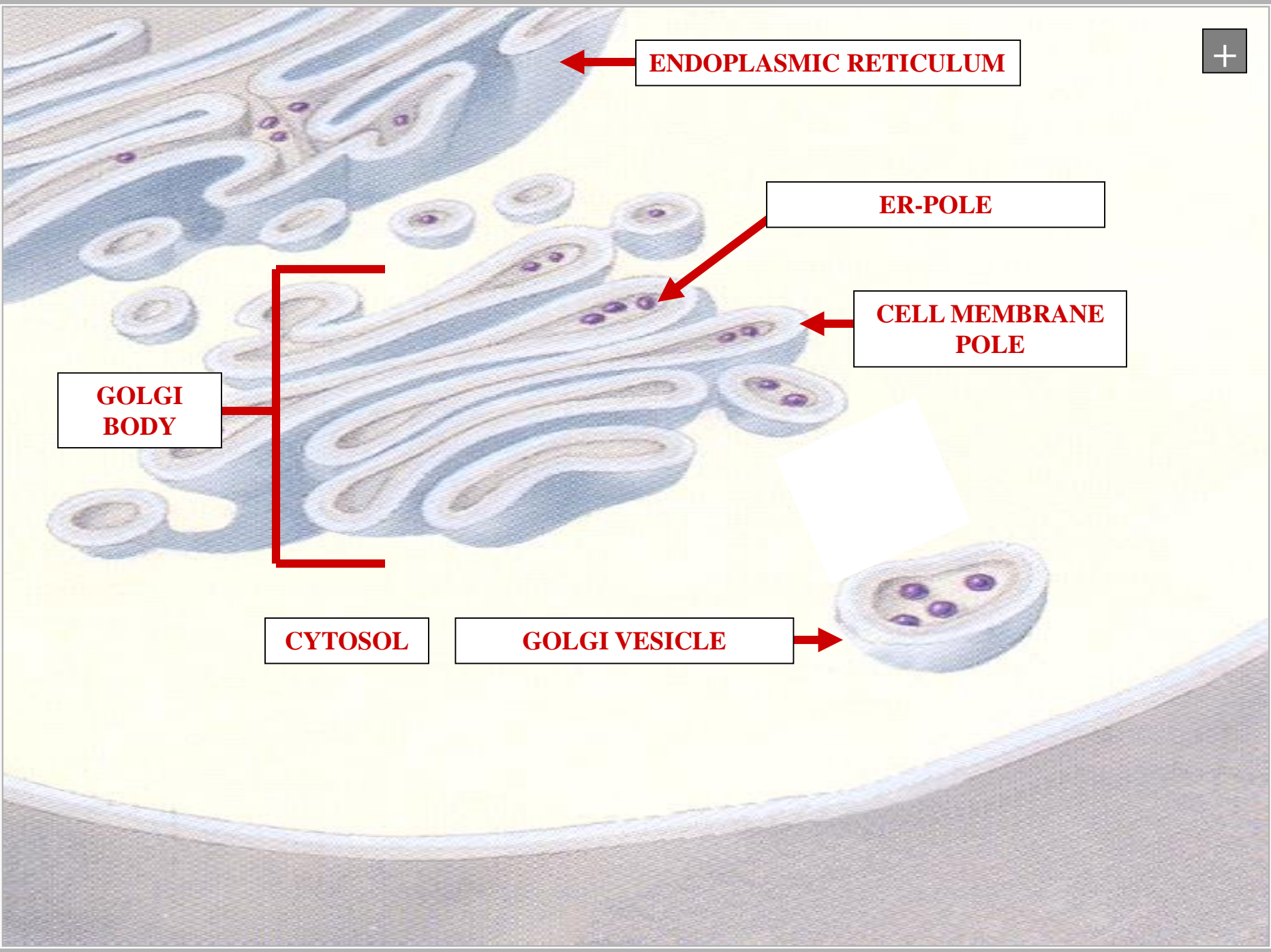
**GOLGI
BODY**

MATURE CONTENT

CYTOSOL

GOLGI VESICLE

CYTOSOL



ENDOPLASMIC RETICULUM

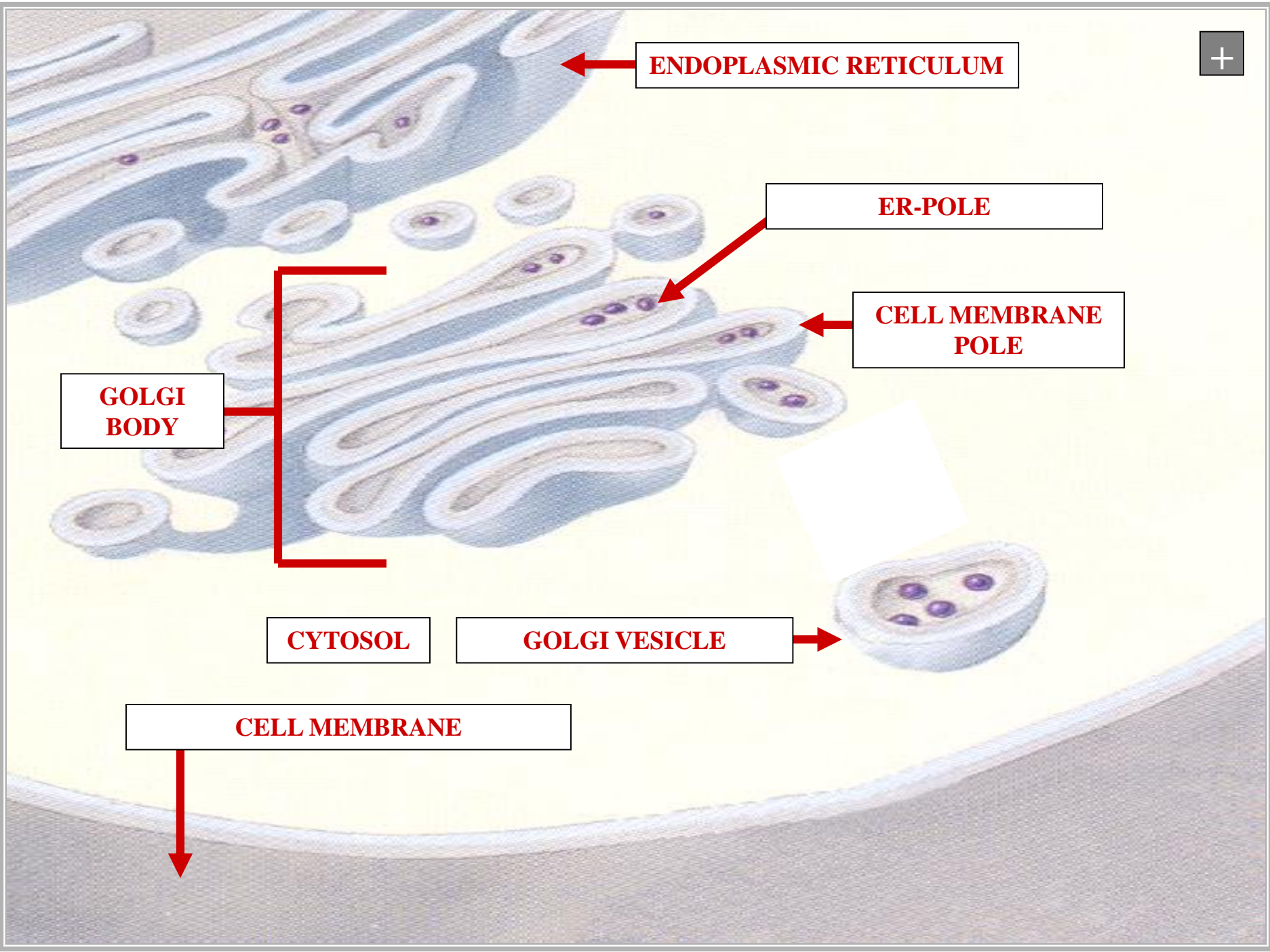
ER-POLE

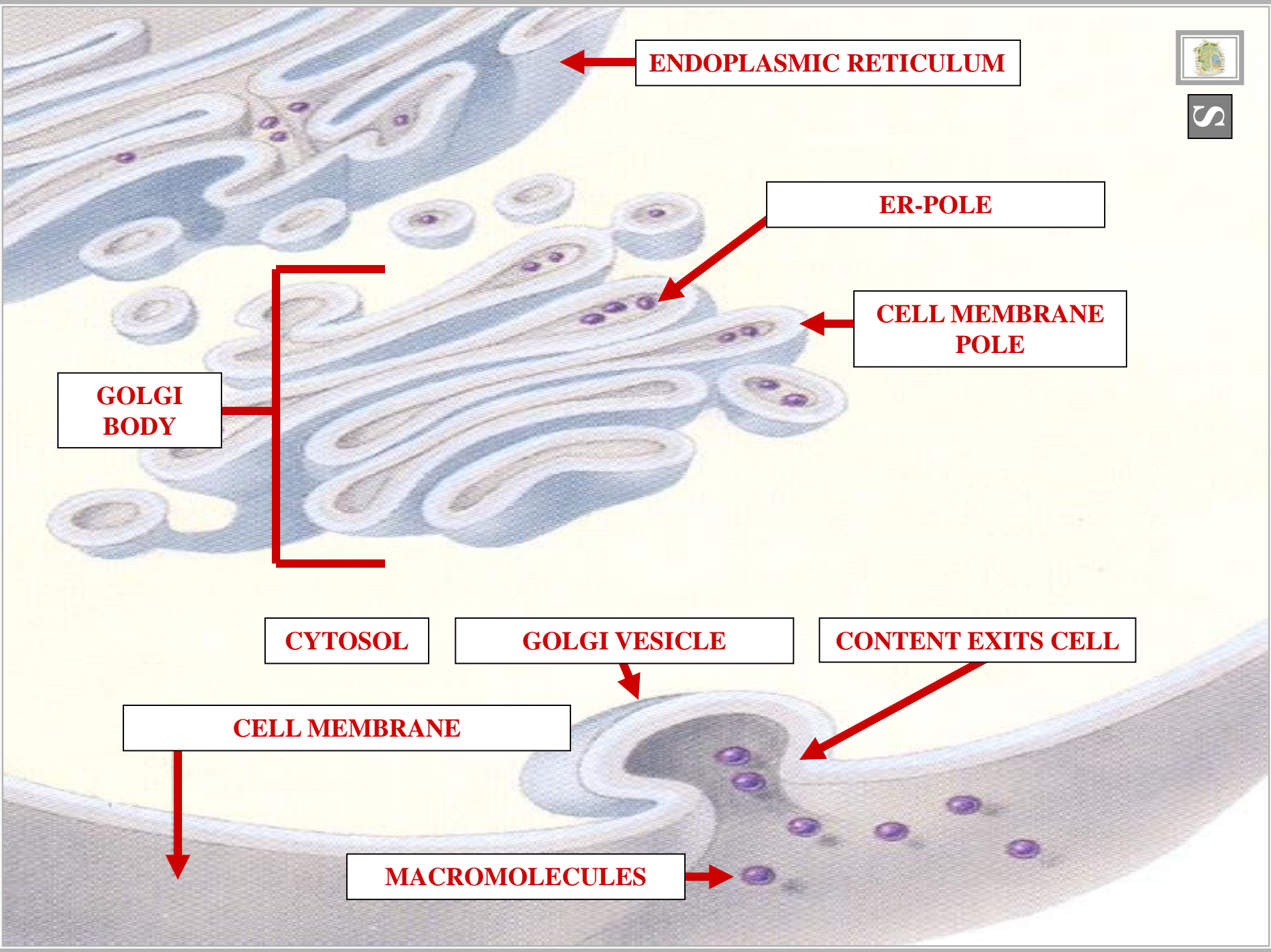
**CELL MEMBRANE
POLE**

**GOLGI
BODY**

CYTOSOL

GOLGI VESICLE





ENDOPLASMIC RETICULUM

ER-POLE

**CELL MEMBRANE
POLE**

**GOLGI
BODY**

CYTOSOL

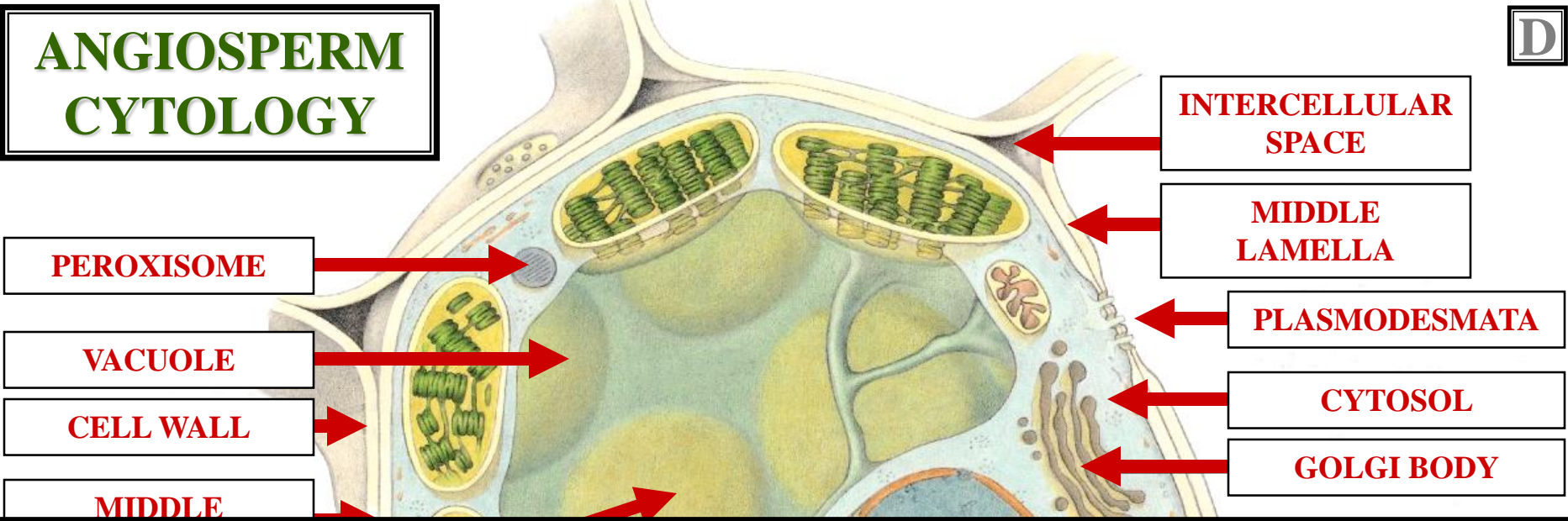
GOLGI VESICLE

CONTENT EXITS CELL

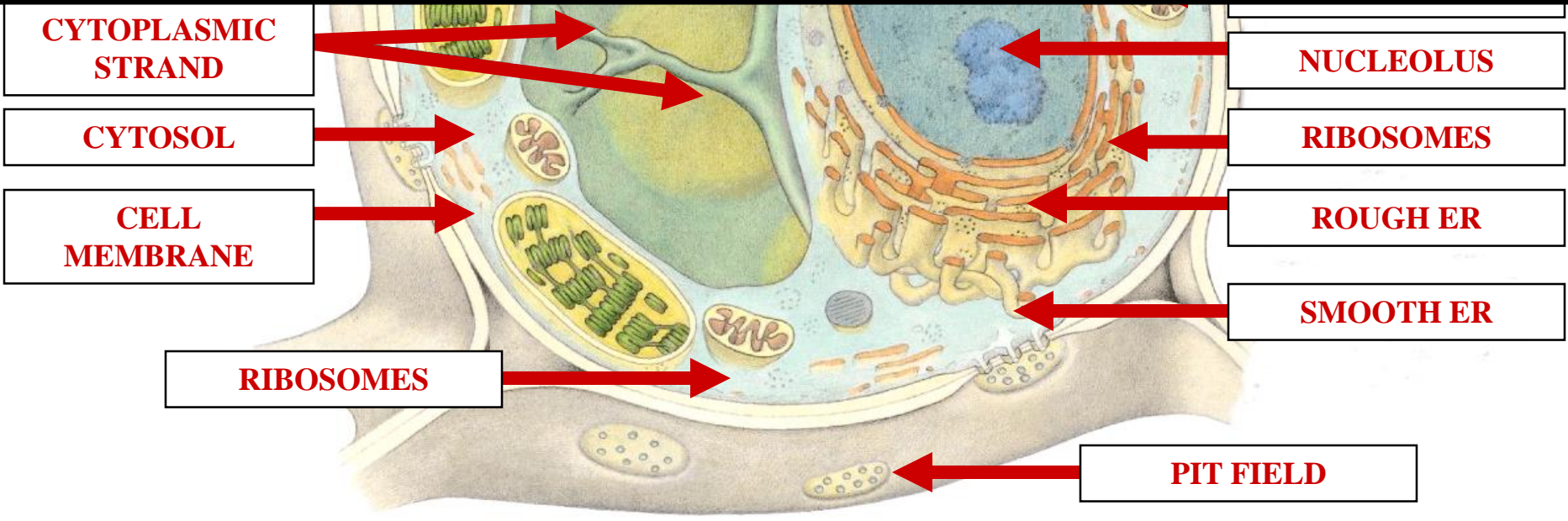
CELL MEMBRANE

MACROMOLECULES

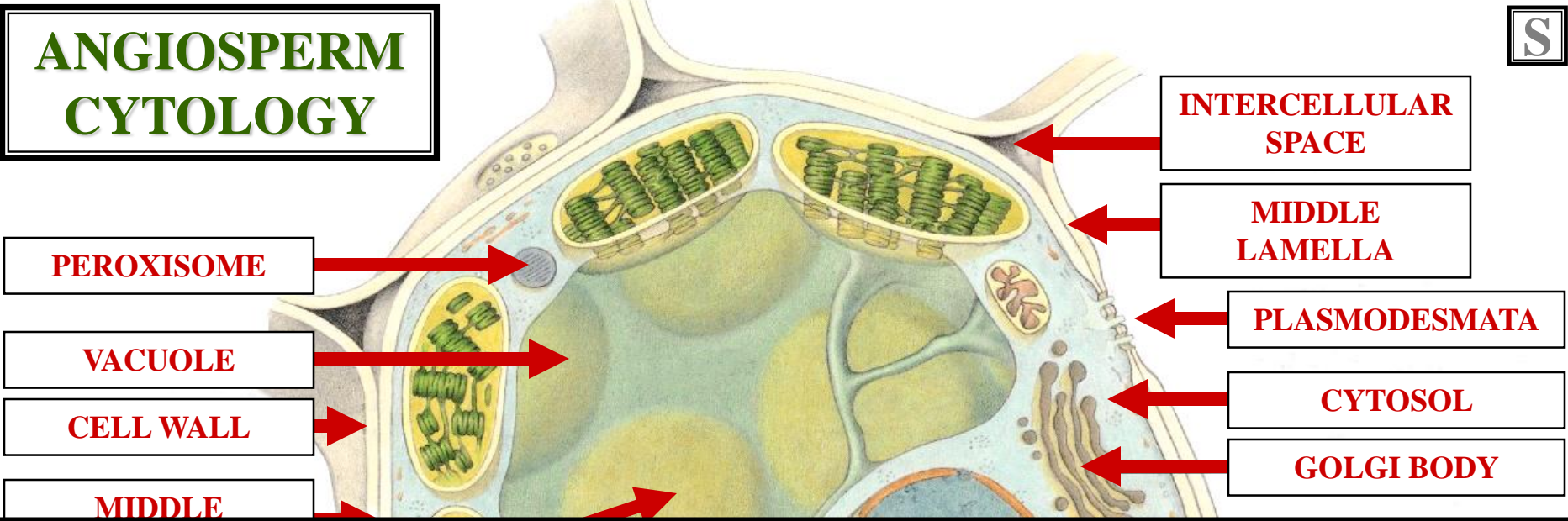
ANGIOSPERM CYTOLOGY



SUMMARY



ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

DOUBLE-MB ORGANELLES

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

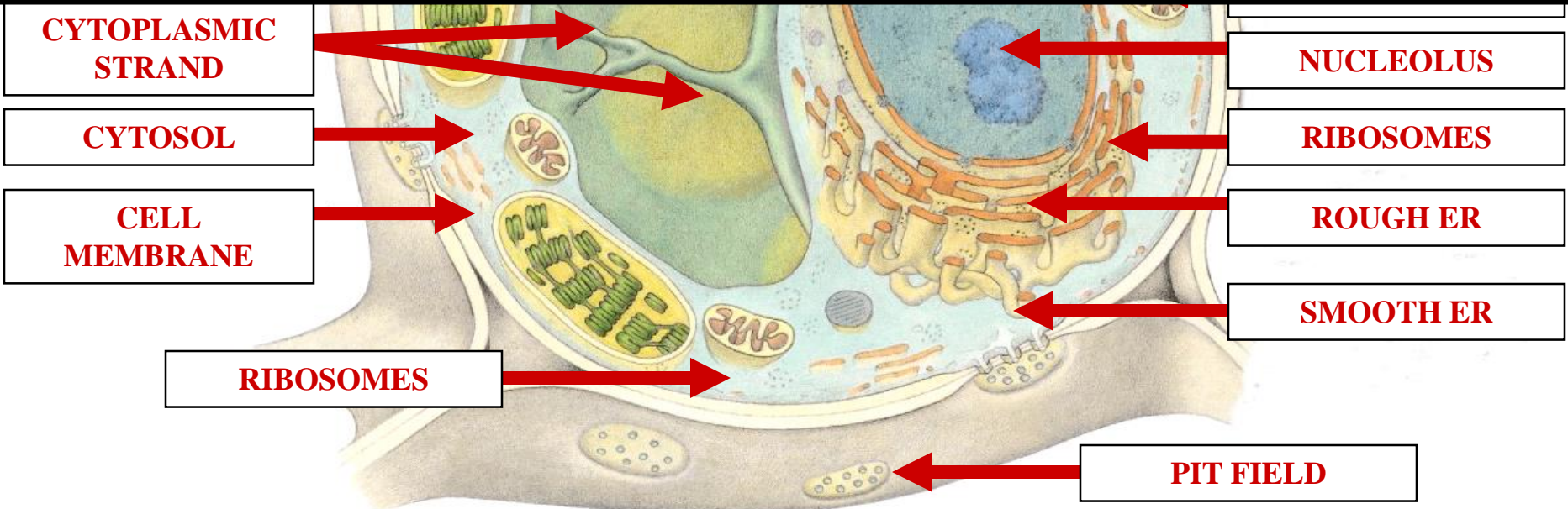
NUCLEOLUS

RIBOSOMES

ROUGH ER

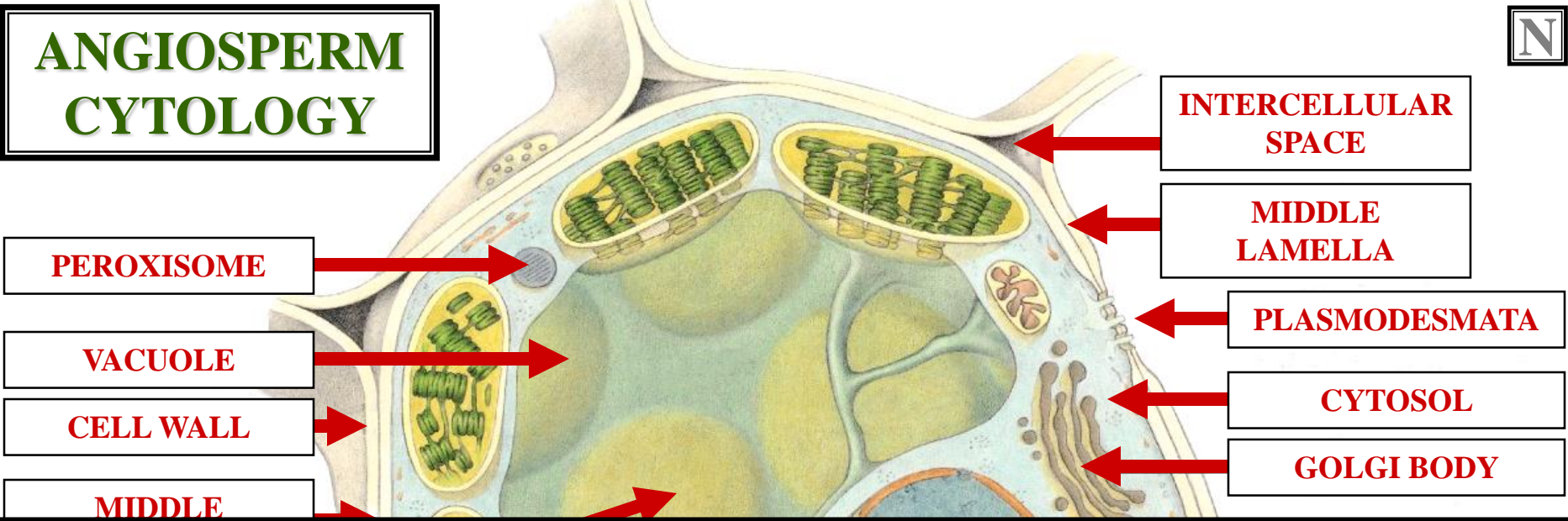
SMOOTH ER

PIT FIELD

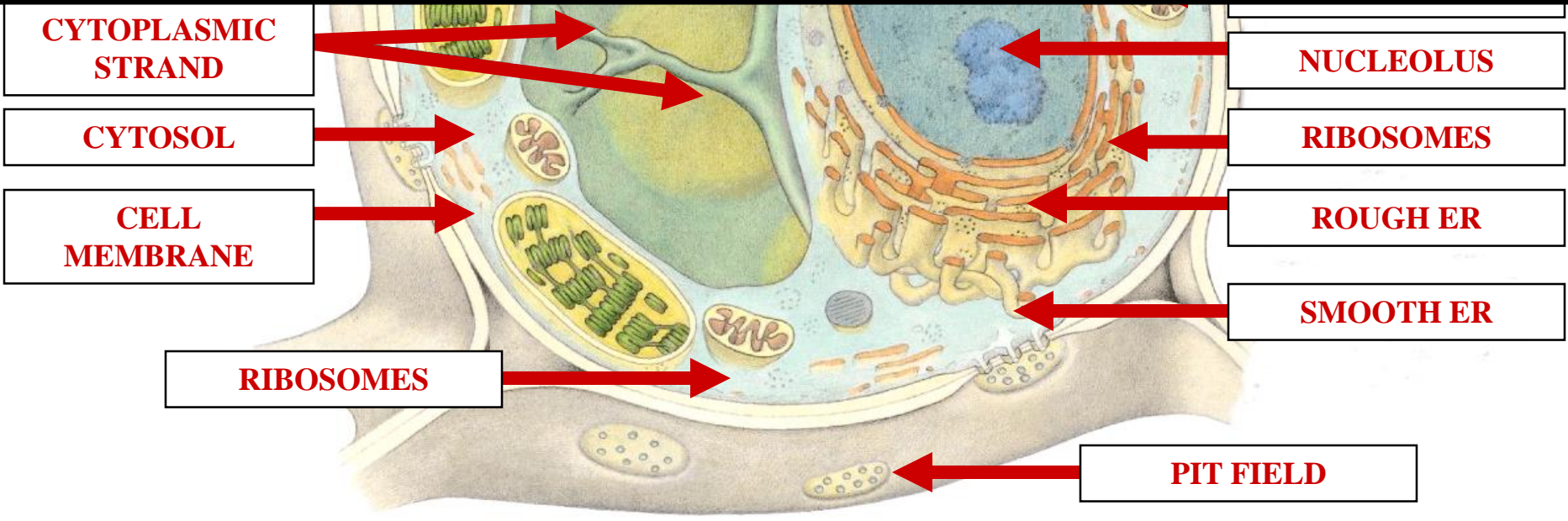




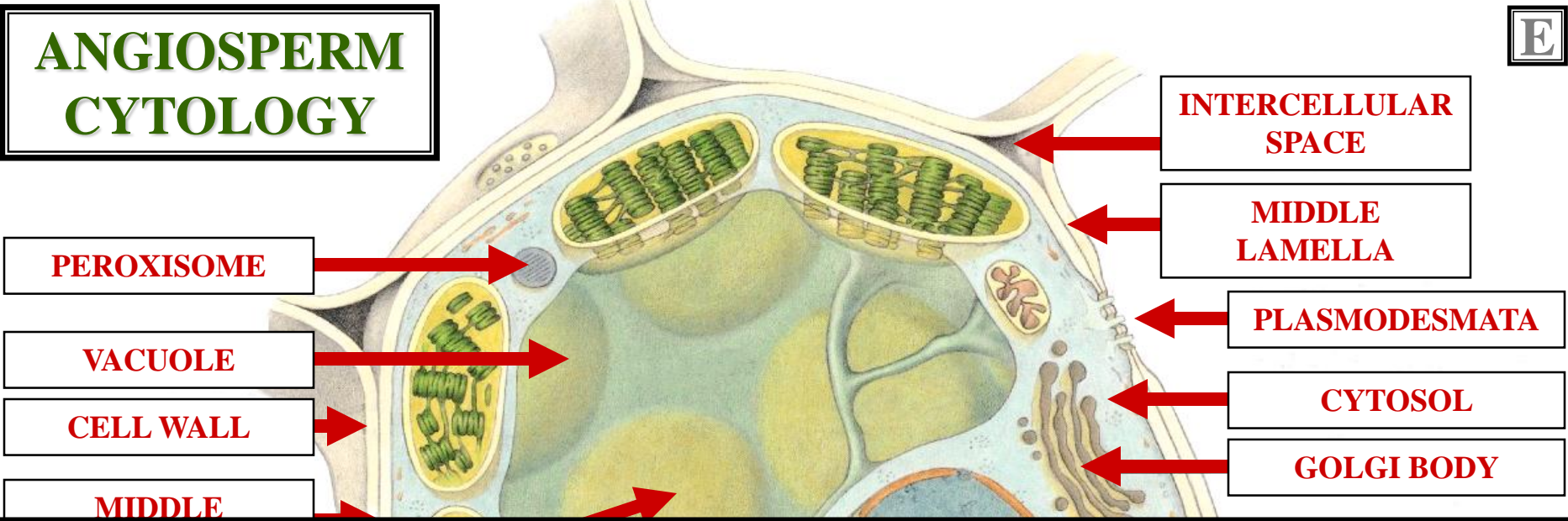
ANGIOSPERM CYTOLOGY



SINGLE-MB ORGANELLES



ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

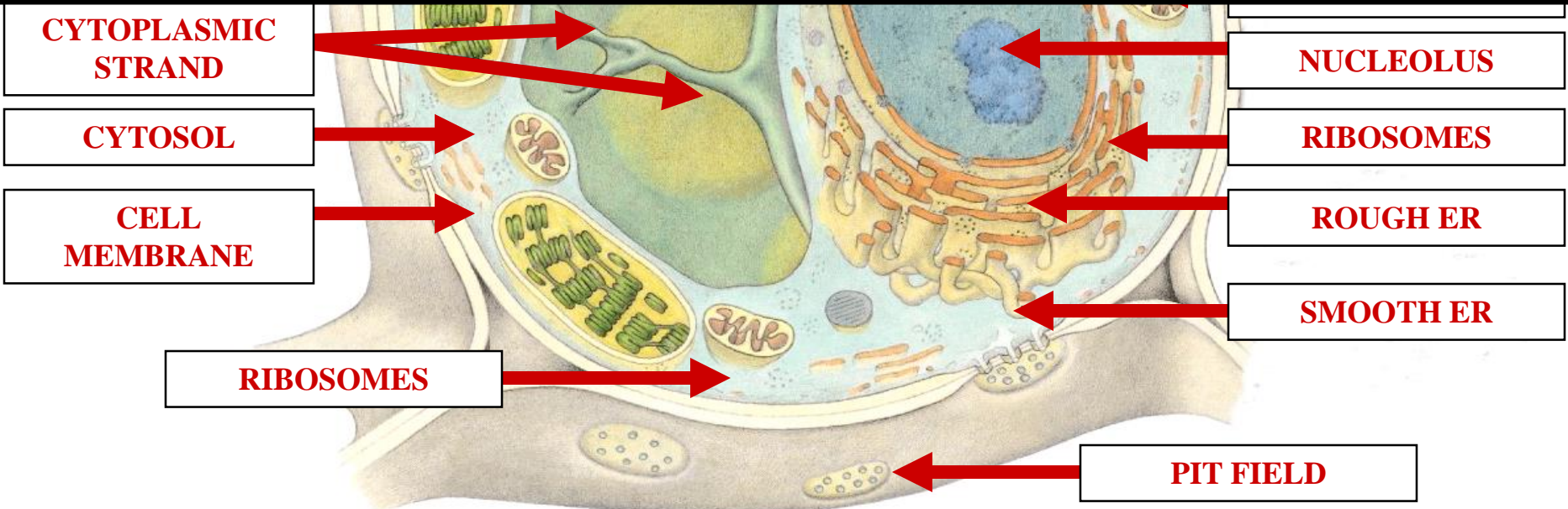
MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

NON-MB ORGANELLE



CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

RIBOSOMES

NUCLEOLUS

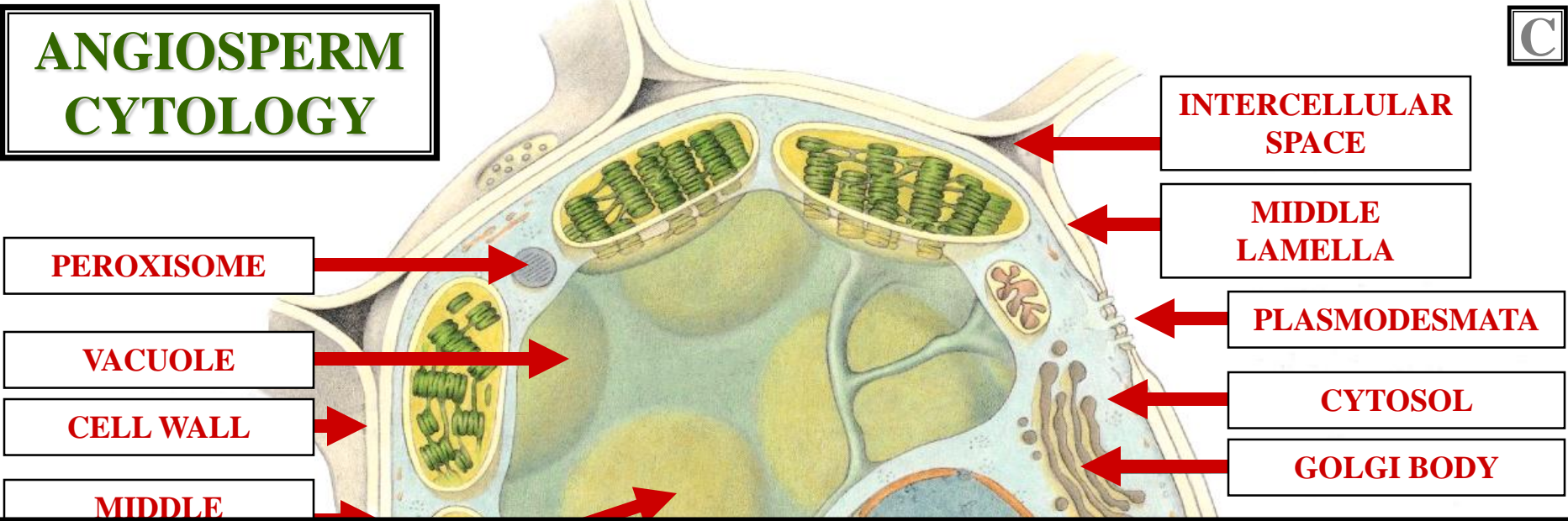
RIBOSOMES

ROUGH ER

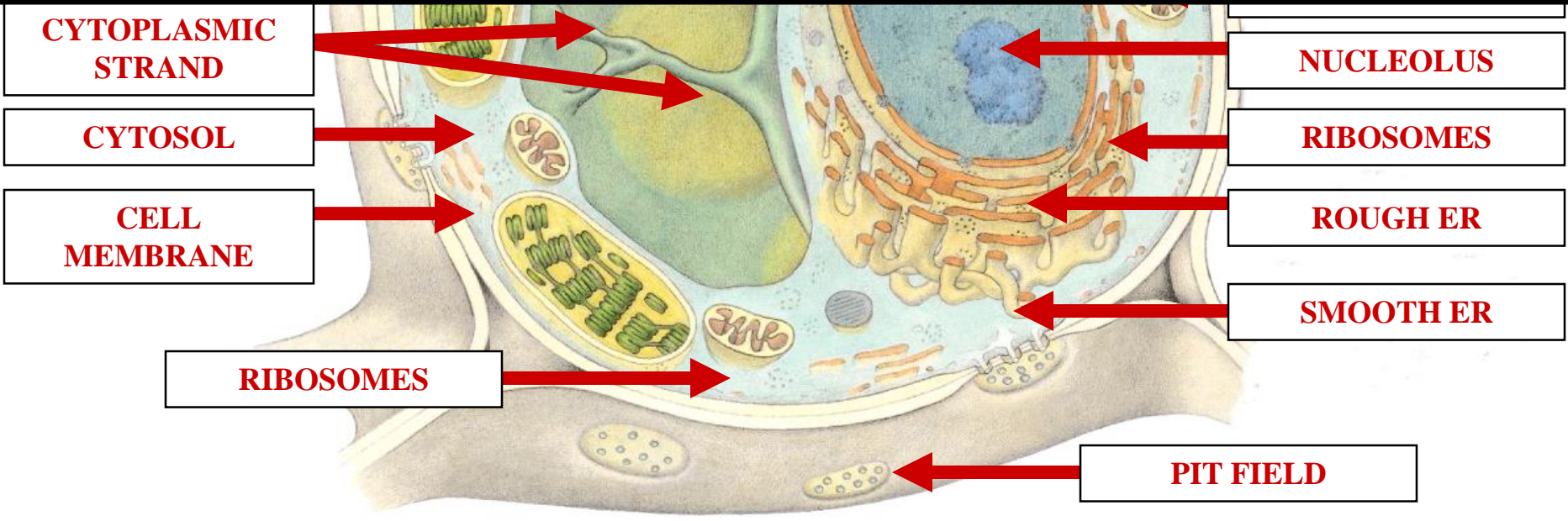
SMOOTH ER

PIT FIELD

ANGIOSPERM CYTOLOGY

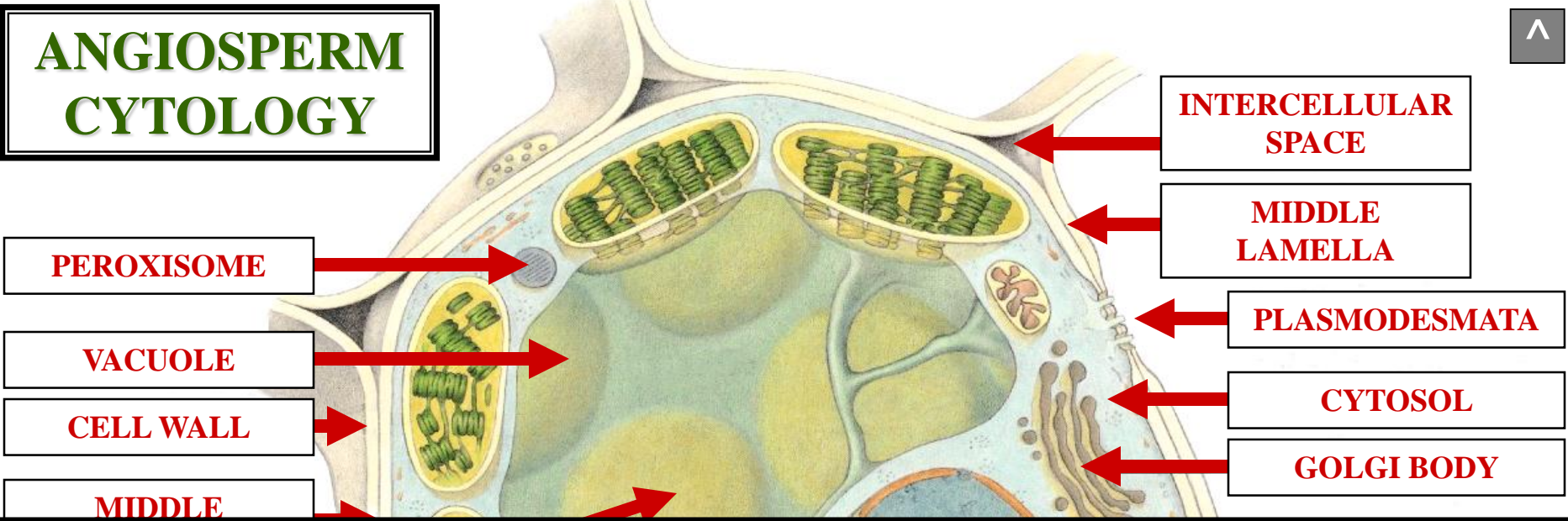


ENDO-MEMBRANE SYSTEM





ANGIOSPERM CYTOLOGY



PEROXISOME

VACUOLE

CELL WALL

MIDDLE

INTERCELLULAR SPACE

MIDDLE LAMELLA

PLASMODESMATA

CYTOSOL

GOLGI BODY

CYTOSKELETON

CYTOPLASMIC STRAND

CYTOSOL

CELL MEMBRANE

NUCLEOLUS

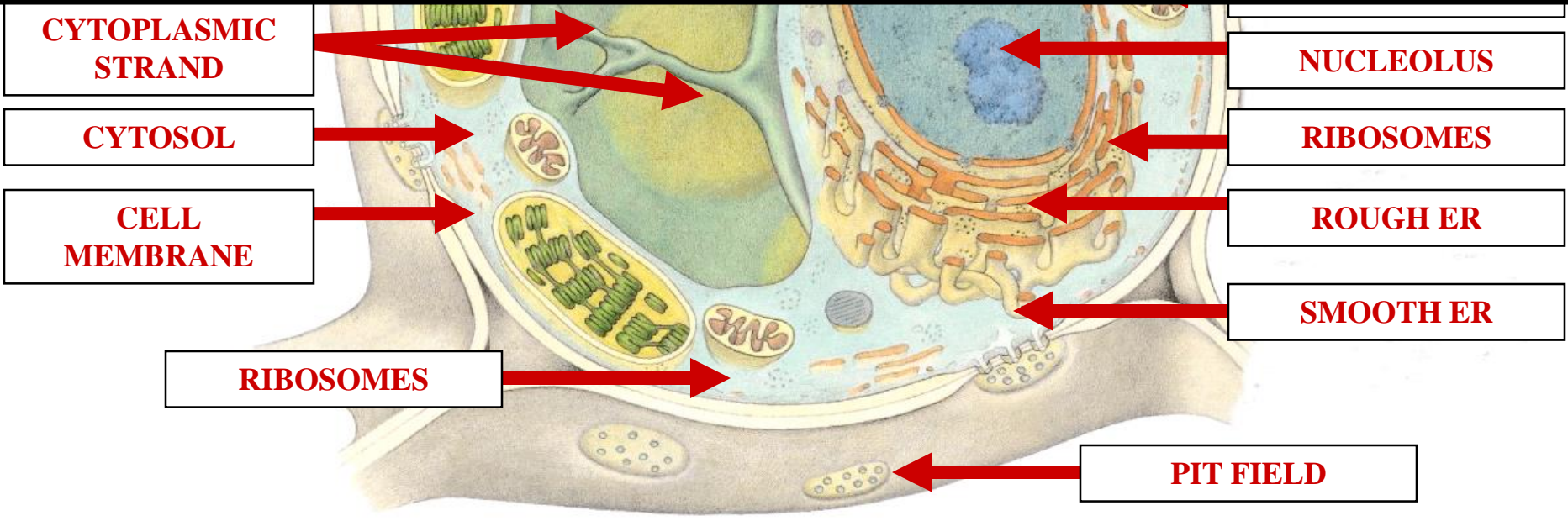
RIBOSOMES

ROUGH ER

SMOOTH ER

RIBOSOMES

PIT FIELD



CYTOSKELETON

CYTOSKELETON

CYTOSKELETON



CELL INTERNAL SUPPORT SYSTEM

CYTOSKELETON

An electron micrograph of a plant cell, showing a thick cell wall and various organelles. The cytoskeleton is visible as a network of fibers, and the internal support system is highlighted by the text. The text is overlaid in a large, bold, red font. A small grey square with a white upward-pointing arrow is located in the top right corner.

**CYTOSKELETON
PLANT CELL
INTERNAL
SUPPORT
SYSTEM**

CYTOSKELETON COMPONENTS

CYTOSKELETON COMPONENTS

MICROFILAMENTS

CYTOSKELETON COMPONENTS

CYTOSKELETON COMPONENTS

MICROFILAMENTS
MICROTUBULES

CYTOSKELETON
COMPONENTS

MICROFILAMENTS



MICROFILAMENTS

SOLID ACTIN FILAMENTS

MICROFILAMENTS



MICROFILAMENTS

SOLID ACTIN FILAMENTS

FOUND THROUGHOUT CYTOSOL

MICROFILAMENTS



MICROFILAMENTS

SOLID ACTIN FILAMENTS

FOUND THROUGHOUT CYTOSOL

INDUCE

CYTOPLASMIC STREAMING

MICROFILAMENTS



MICROFILAMENTS

SOLID ACTIN FILAMENTS

FOUND THROUGHOUT CYTOSOL

INDUCE CYCLOSIS

MICROFILAMENTS

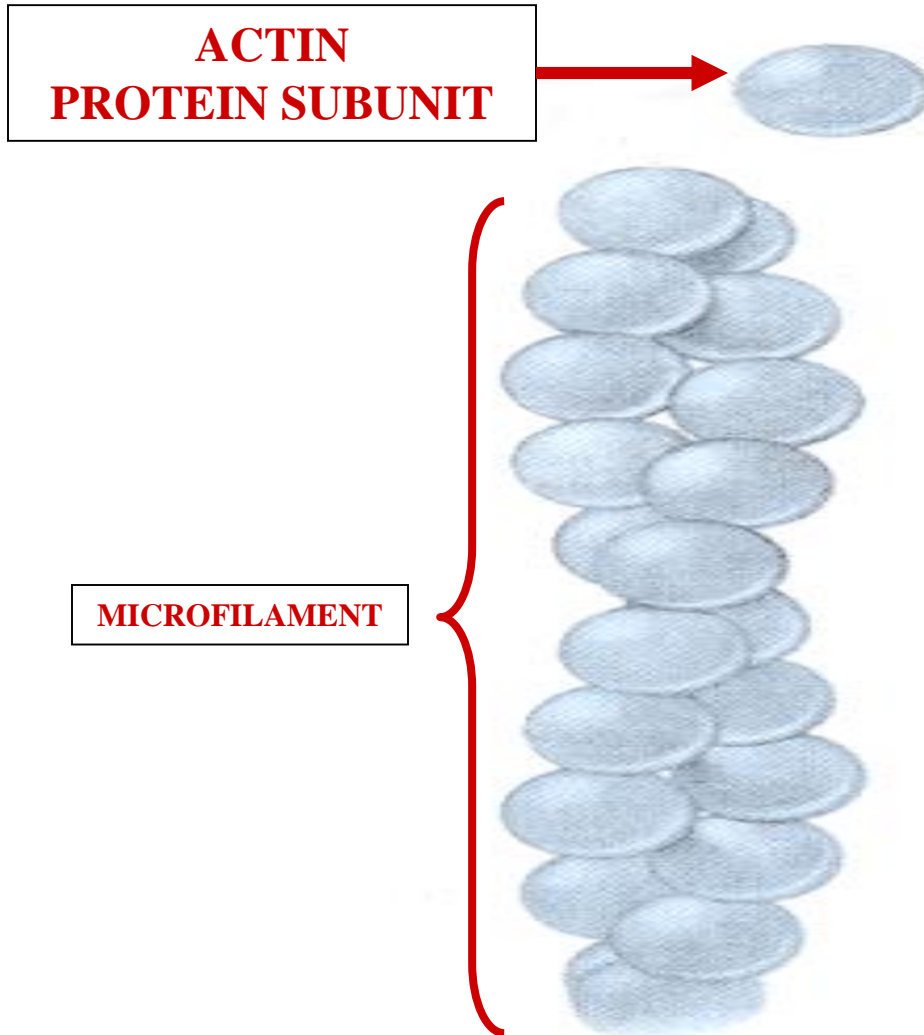
**CYTOPLASMIC
STREAMING**

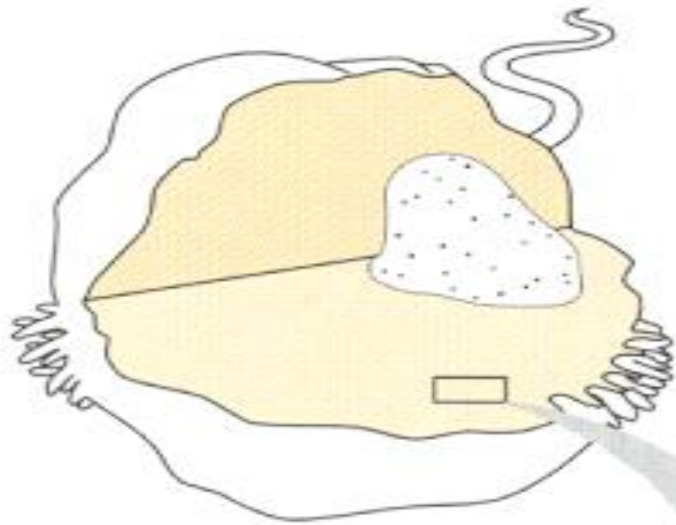
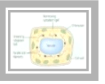


SYNONYMOUS

CYCLOSIS

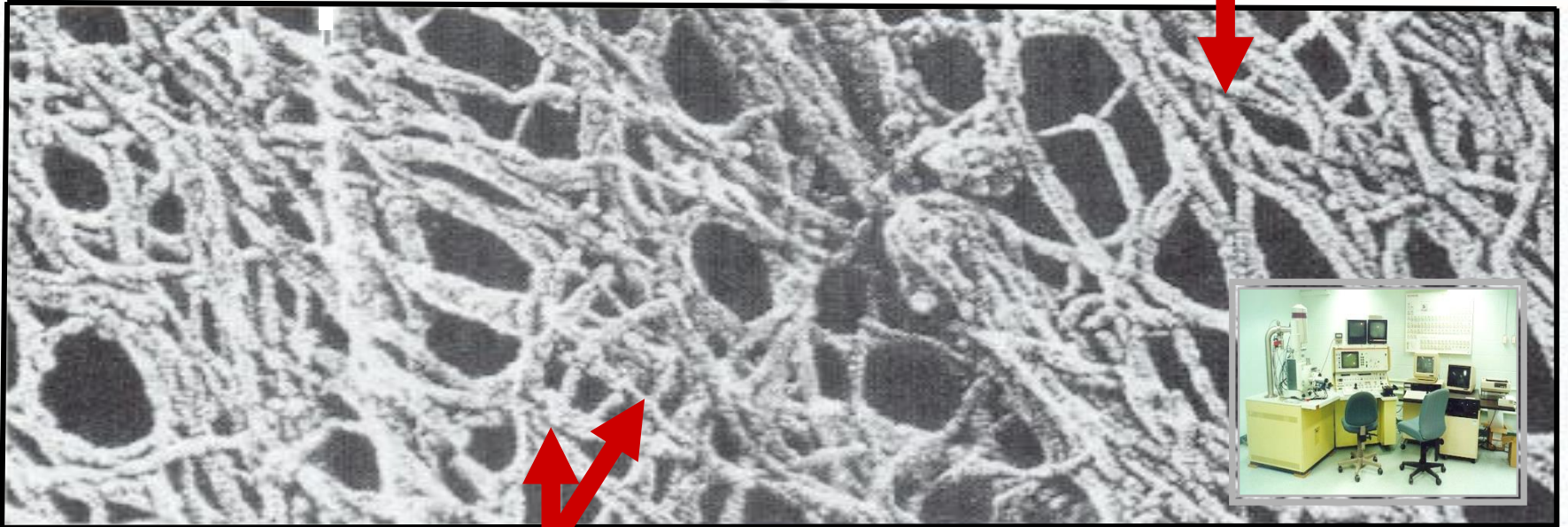
MICROFILAMENT COMPOSITION





CYTOSKELETON ULTRASTRUCTURE

CYTOSOL



MICROFILAMENTS

