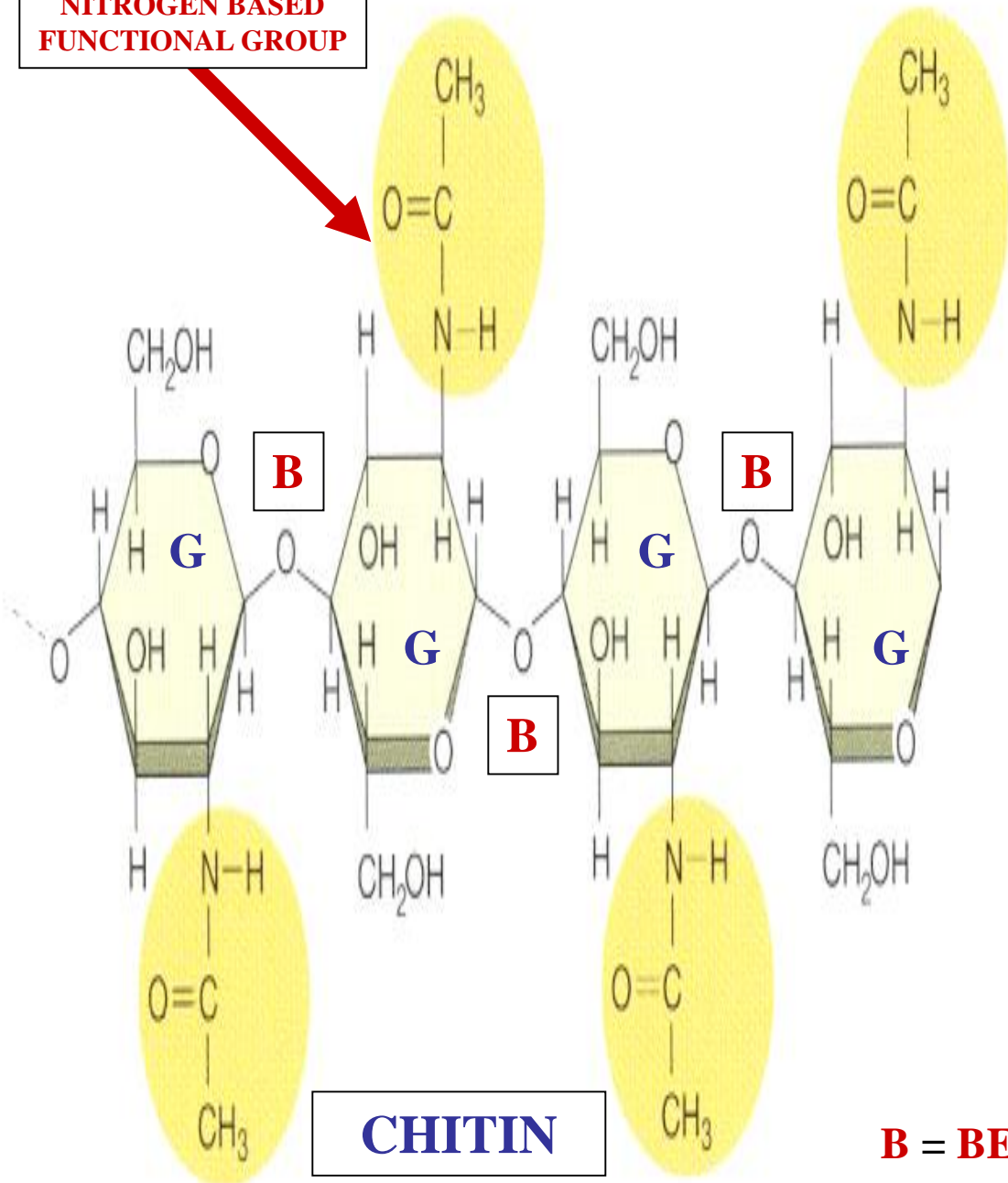


**NITROGEN BASED
FUNCTIONAL GROUP**



B = BETA BOND G = GLUCOSE



CELL WALL COMPOSITION SUMMARY



C

PLANT CELL WALL





PLANT CELL WALL

COMPOSITION: **POLYSACCHARIDE CELLULOSE**





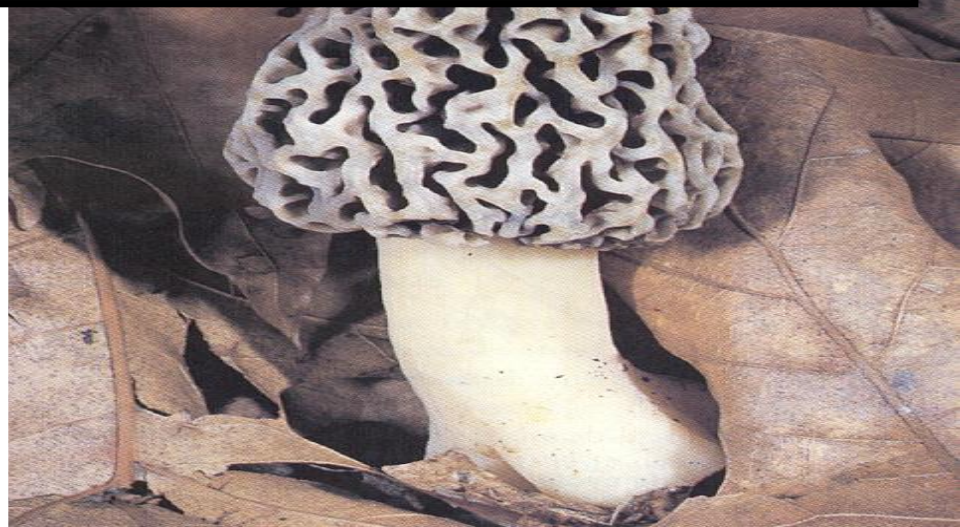
FUNGUS CELL WALL





FUNGUS CELL WALL

COMPOSITION: **POLYSACCHARIDE CHITIN**



PROTOPLAST

PROTOPLAST

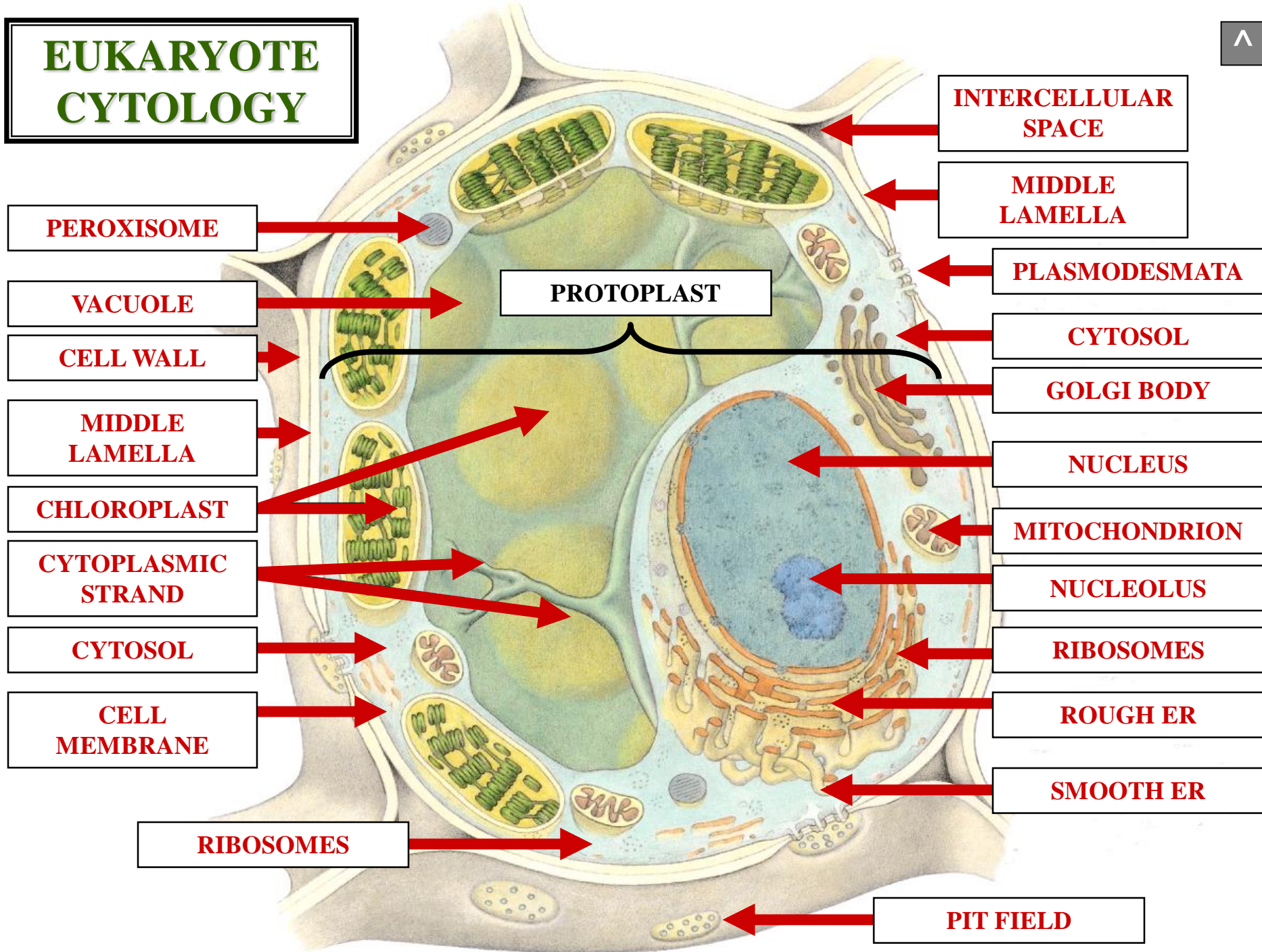


PROTOPLAST

**CELL
LIVING CONTENT**

PROTOPLAST

EUKARYOTE CYTOLOGY



CELL MEMBRANE

CELL MEMBRANE



CELL MEMBRANE

**OUTER PROTOPLAST
BOUNDARY**

CELL MEMBRANE



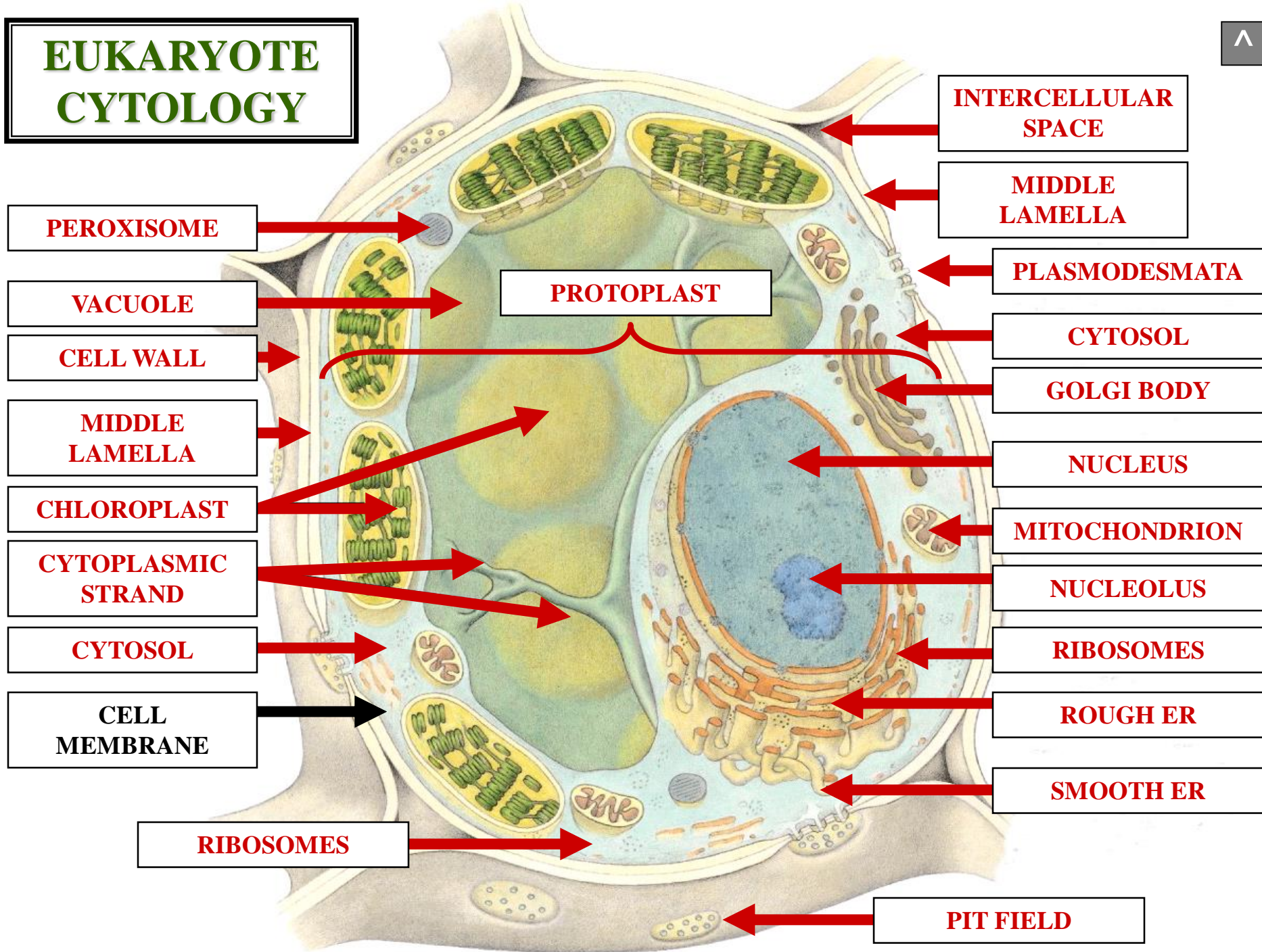
CELL MEMBRANE

**OUTER PROTOPLAST
BOUNDARY**

**MEDIATES TRANSPORT
INTO & OUT OF CELL**

CELL MEMBRANE

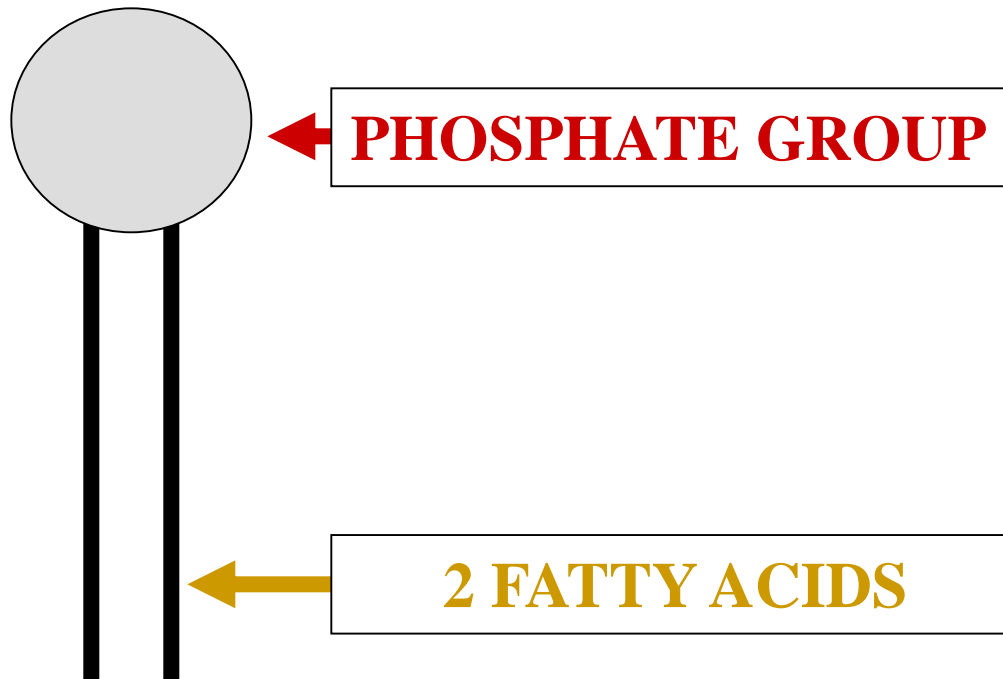
EUKARYOTE CYTOLOGY





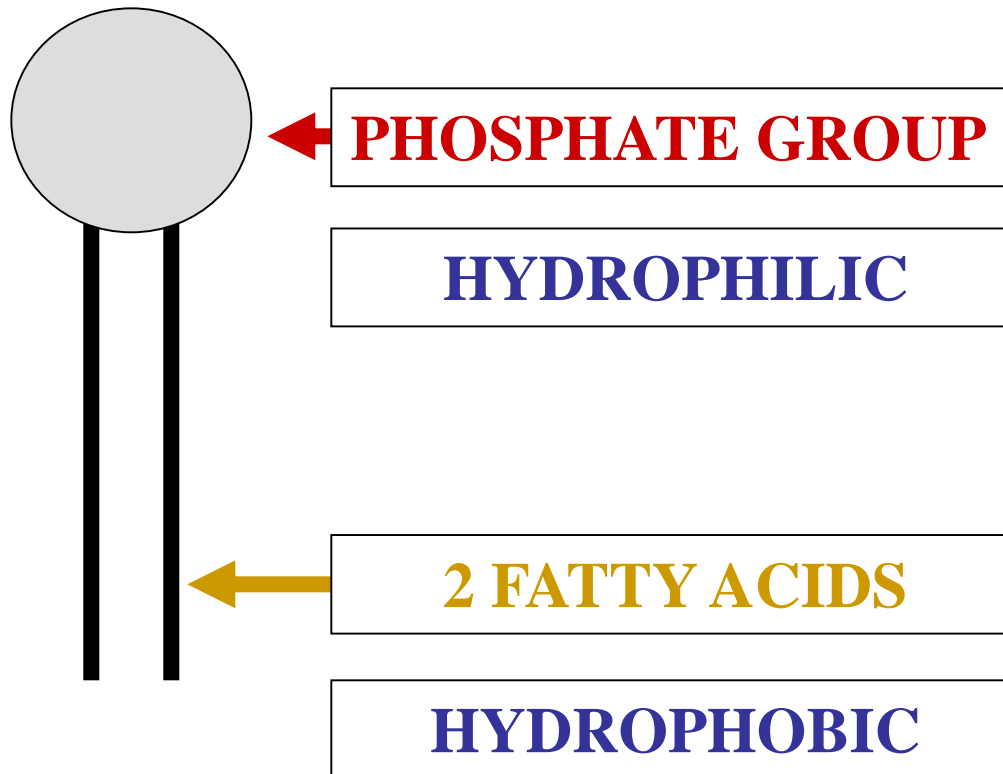
CELL MEMBRANE COMPOSITION

CELL MEMBRANE COMPOSITION



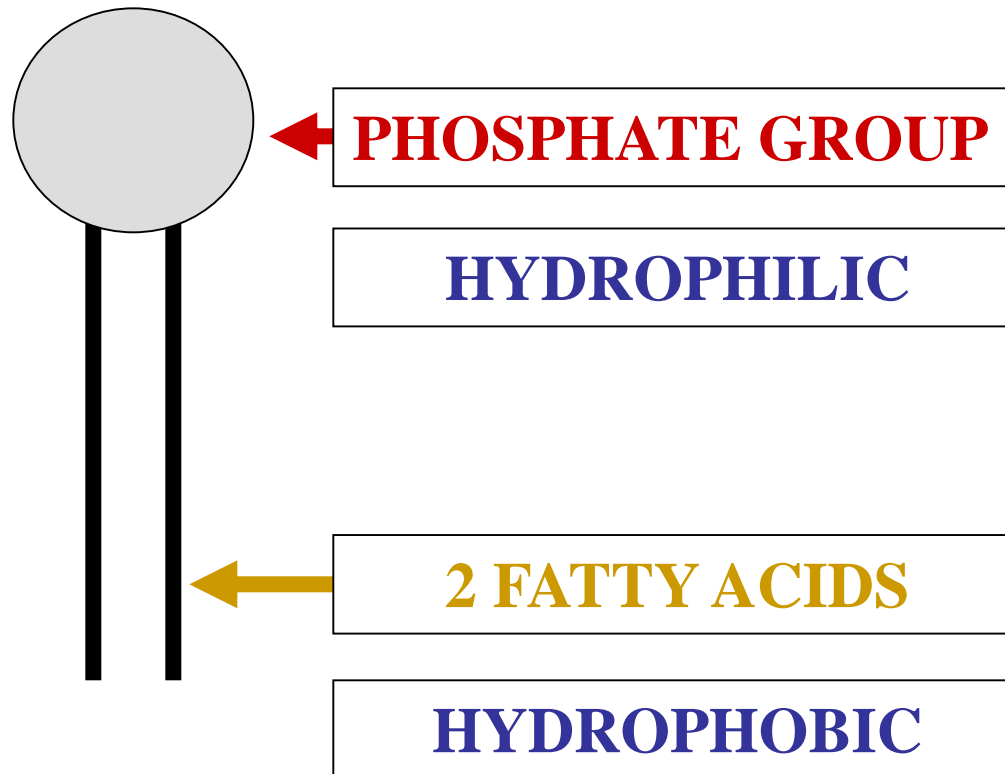
?

CELL MEMBRANE COMPOSITION



PHOSPHOLIPID

CELL MEMBRANE COMPOSITION



PHOSPHOLIPID: AMPHIPATHIC



AQUEOUS SOLUTION

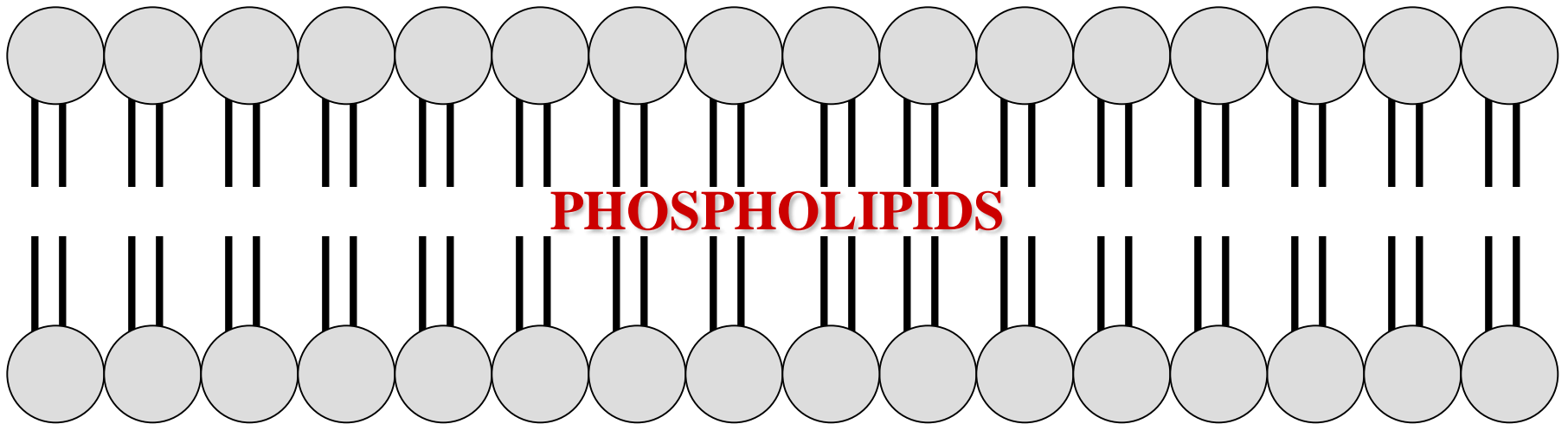
EUKARYOTE

CELL MEMBRANE COMPOSITION

WATER

WATER

WATER



PHOSPHOLIPIDS

WATER

WATER

WATER

CELL MEMBRANE COMPOSITION

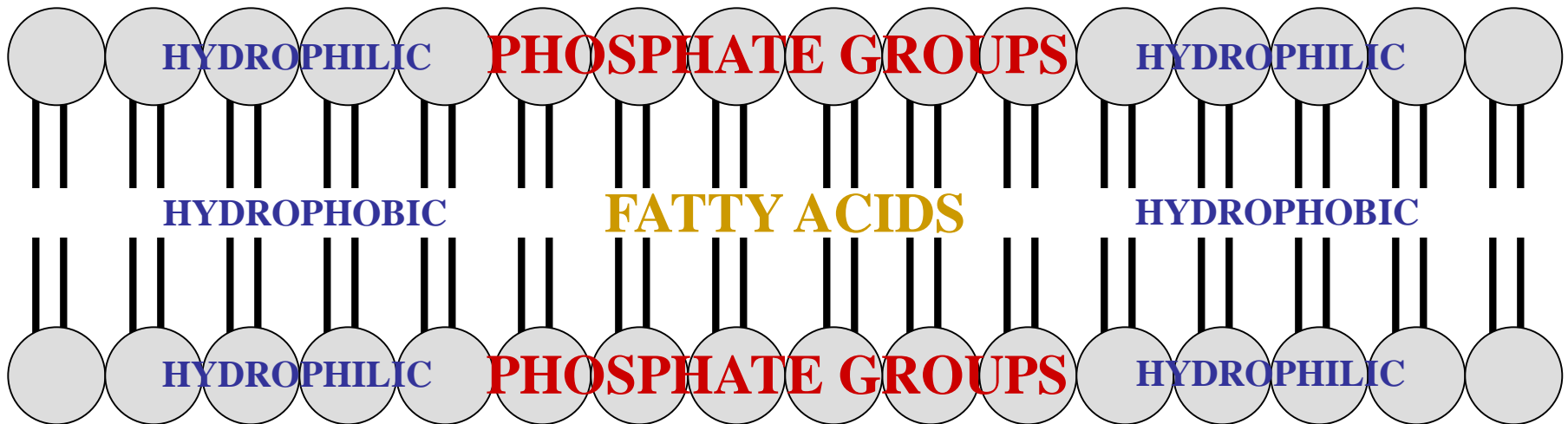
CELL MEMBRANE COMPOSITION



WATER

WATER

WATER



WATER

WATER

WATER

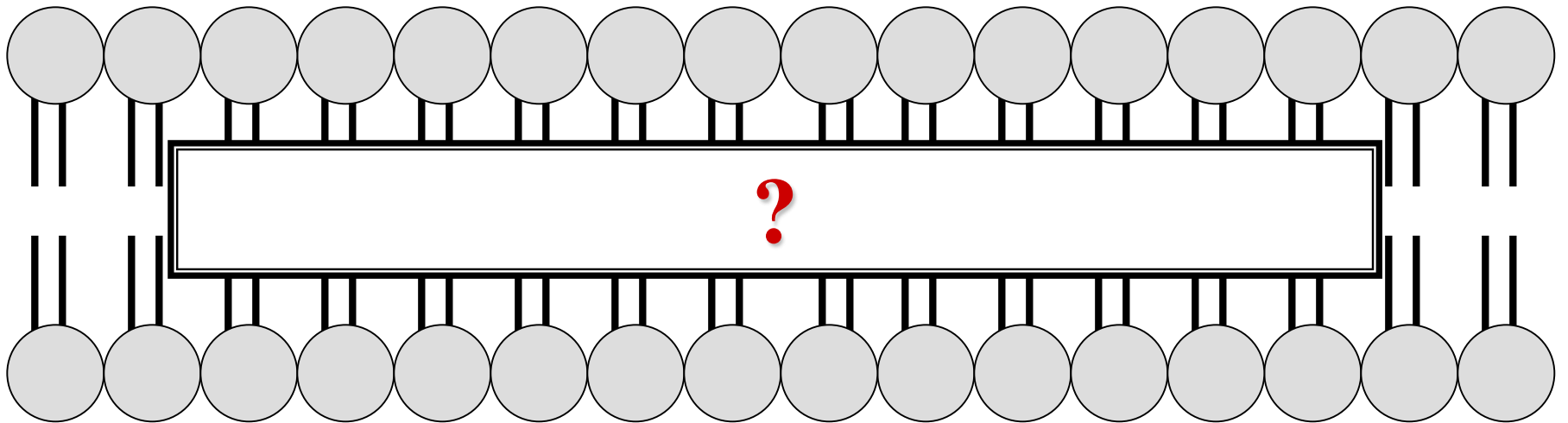
CELL MEMBRANE COMPOSITION

CELL MEMBRANE COMPOSITION

WATER

WATER

WATER



WATER

WATER

WATER

CELL MEMBRANE COMPOSITION

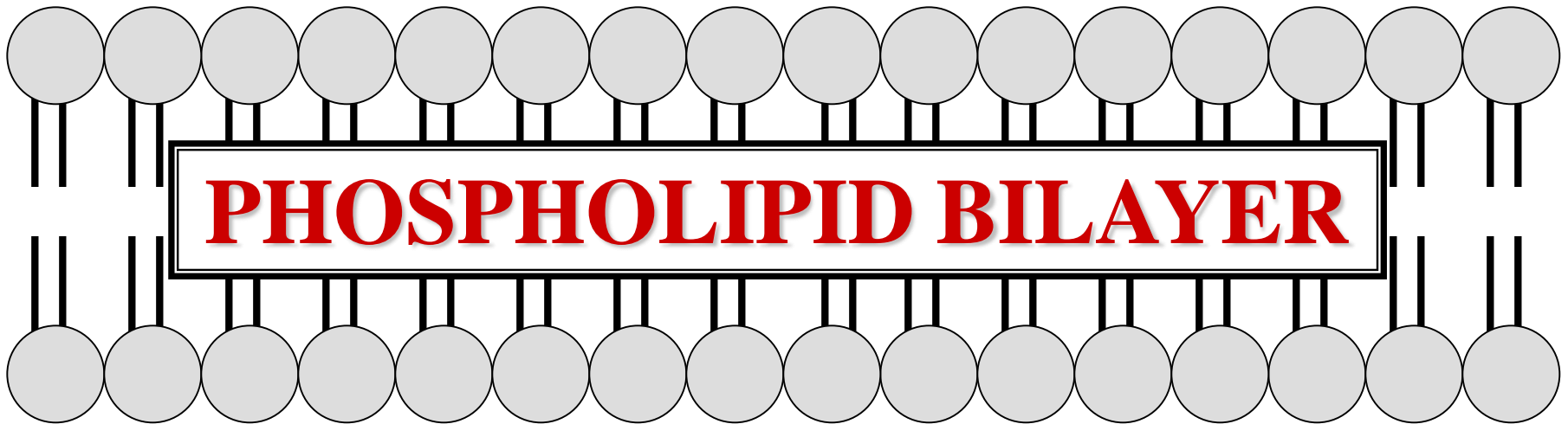
CELL MEMBRANE COMPOSITION



WATER

WATER

WATER



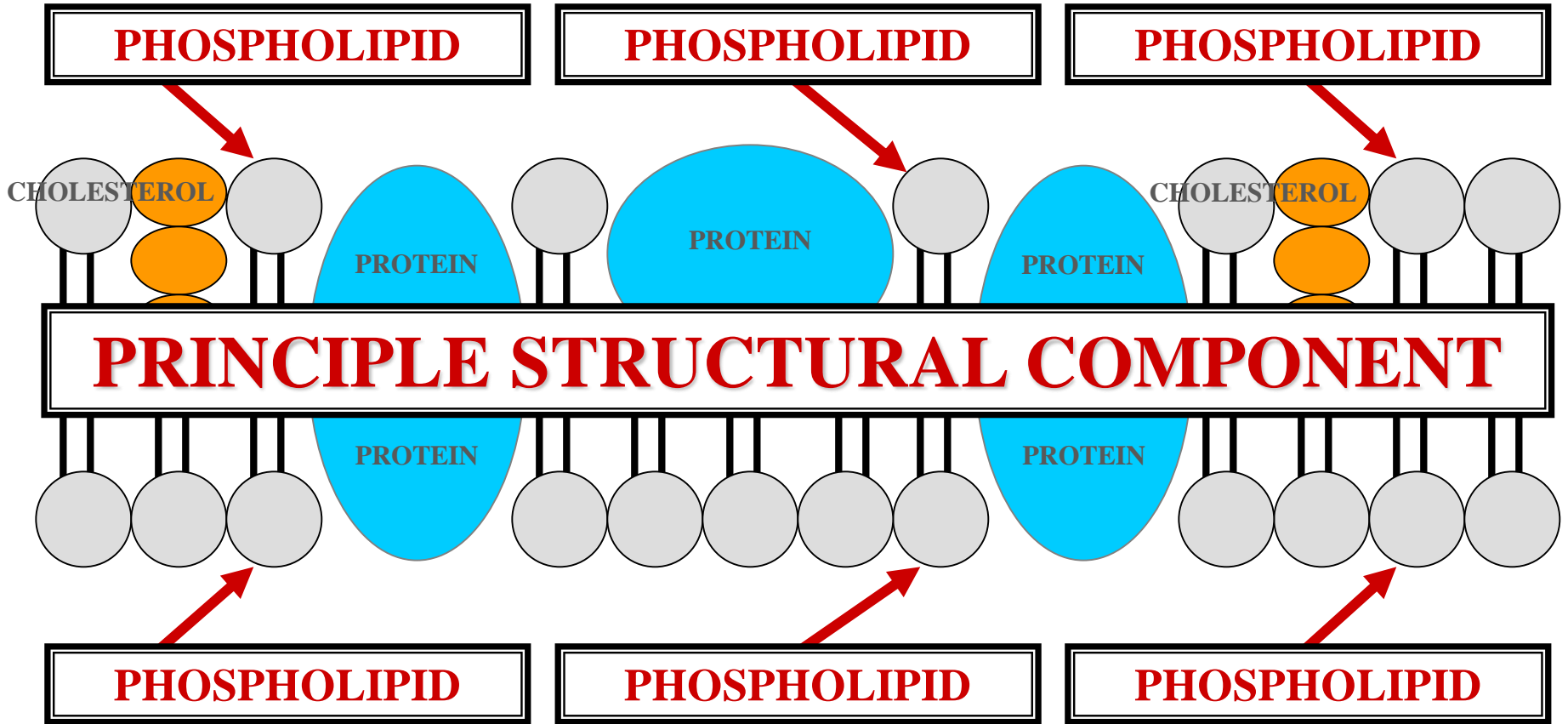
WATER

WATER

WATER

CELL MEMBRANE COMPOSITION

BIO-MEMBRANE STRUCTURE



BIO-MEMBRANE STRUCTURE

CYTOPLASM

CYTOPLASM

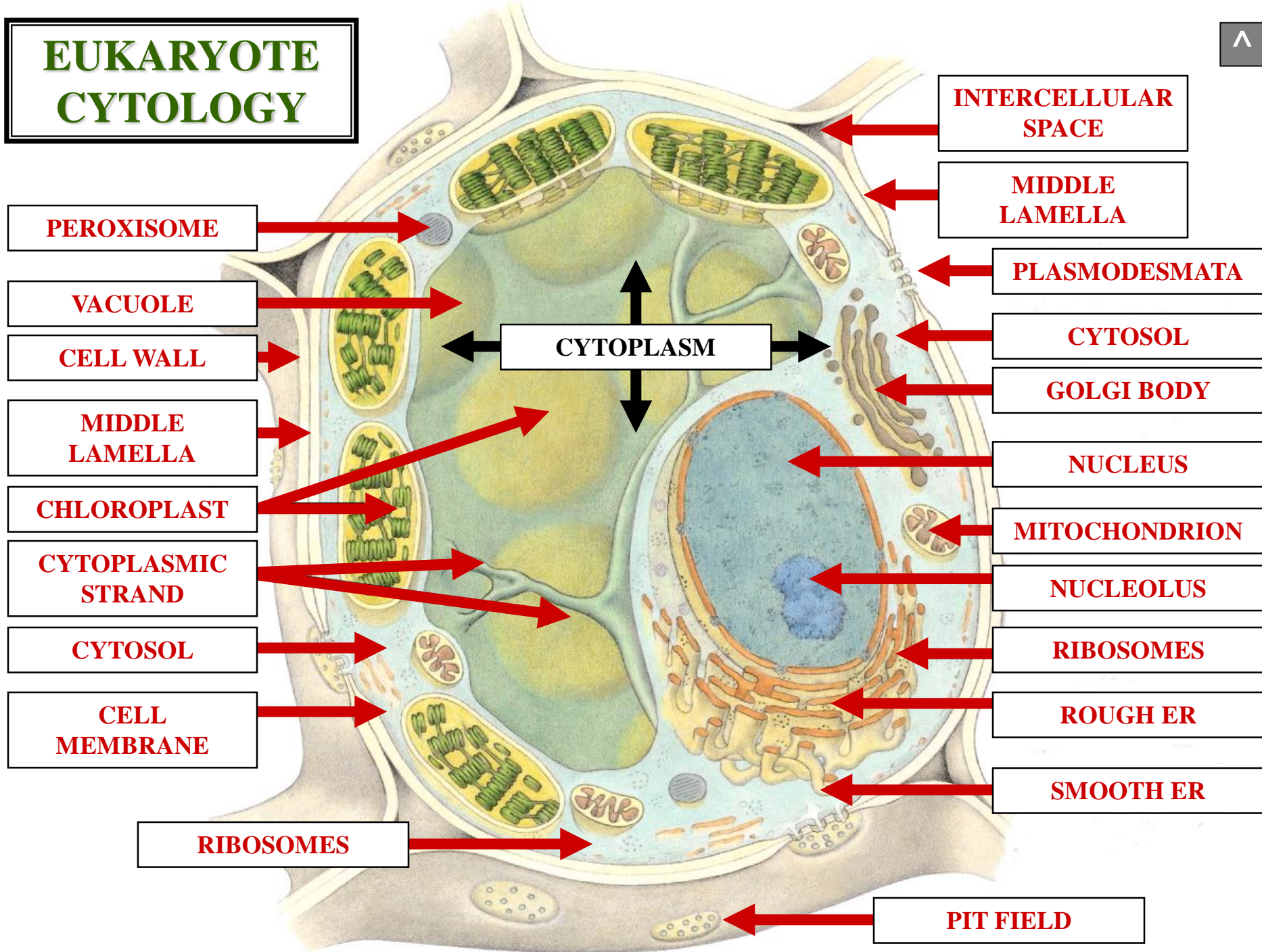


CYTOPLASM

**CONTENT BEYOND
CELL MEMBRANE**

CYTOPLASM

EUKARYOTE CYTOLOGY



CYTOPLASM COMPONENTS

CYTOPLASM COMPONENTS

CYTOSOL

CYTOPLASM COMPONENTS

CYTOPLASM COMPONENTS

**CYTOSOL
ORGANELLES**

**CYTOPLASM
COMPONENTS**

CYTOSOL

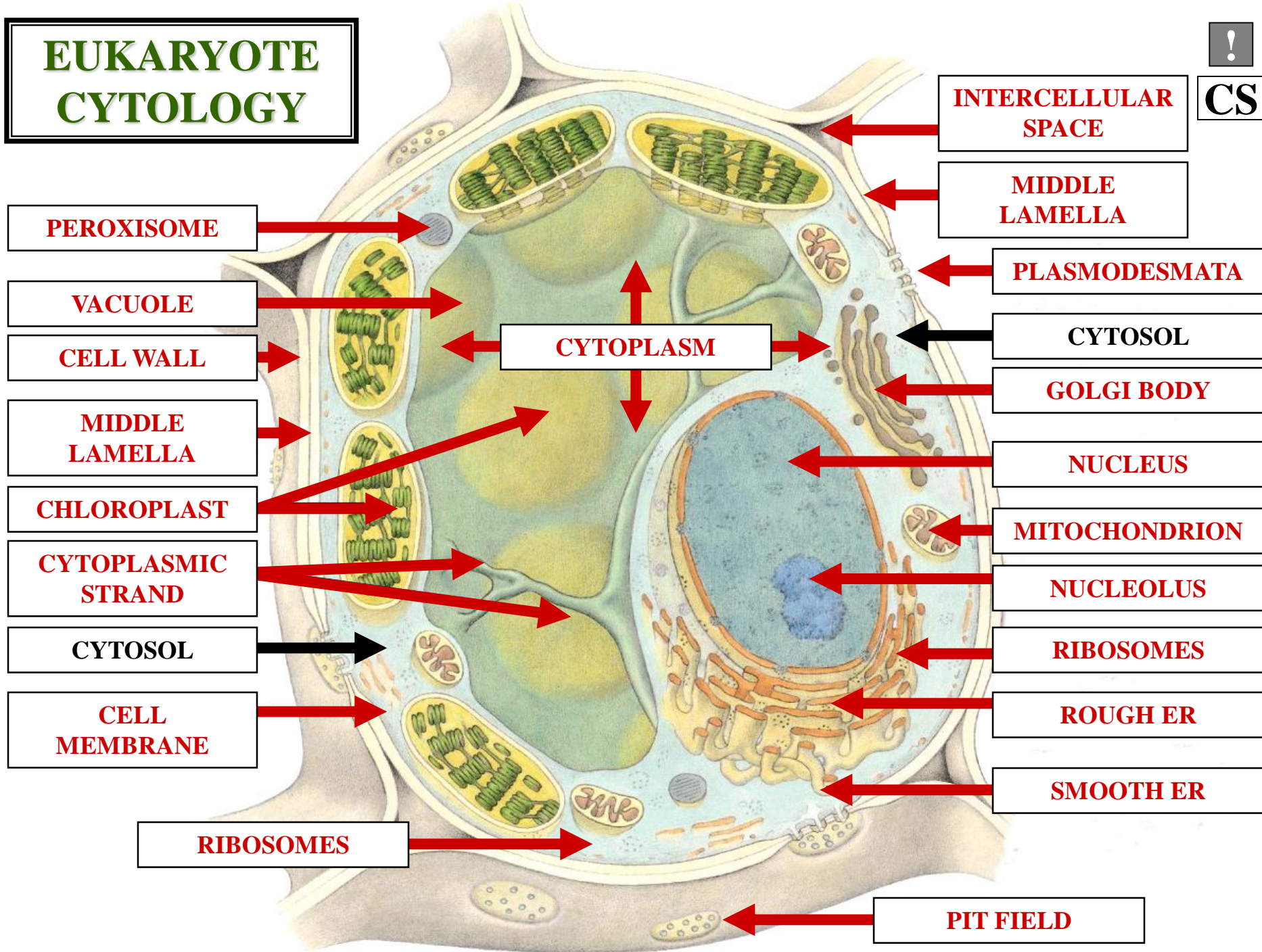


CYTOSOL

FLIUD MATRIX

CYTOSOL

EUKARYOTE CYTOLOGY



CYTOPLASMIC STREAMING



CYCLOSIS

CYTOPLASMIC
STREAMING



SYNONYMOUS

CYCLOSIS

**CYTOPLASMIC STREAMING
CYCLOSIS**



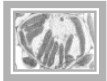
CYTOSOL MOVEMENT

OUTCOME

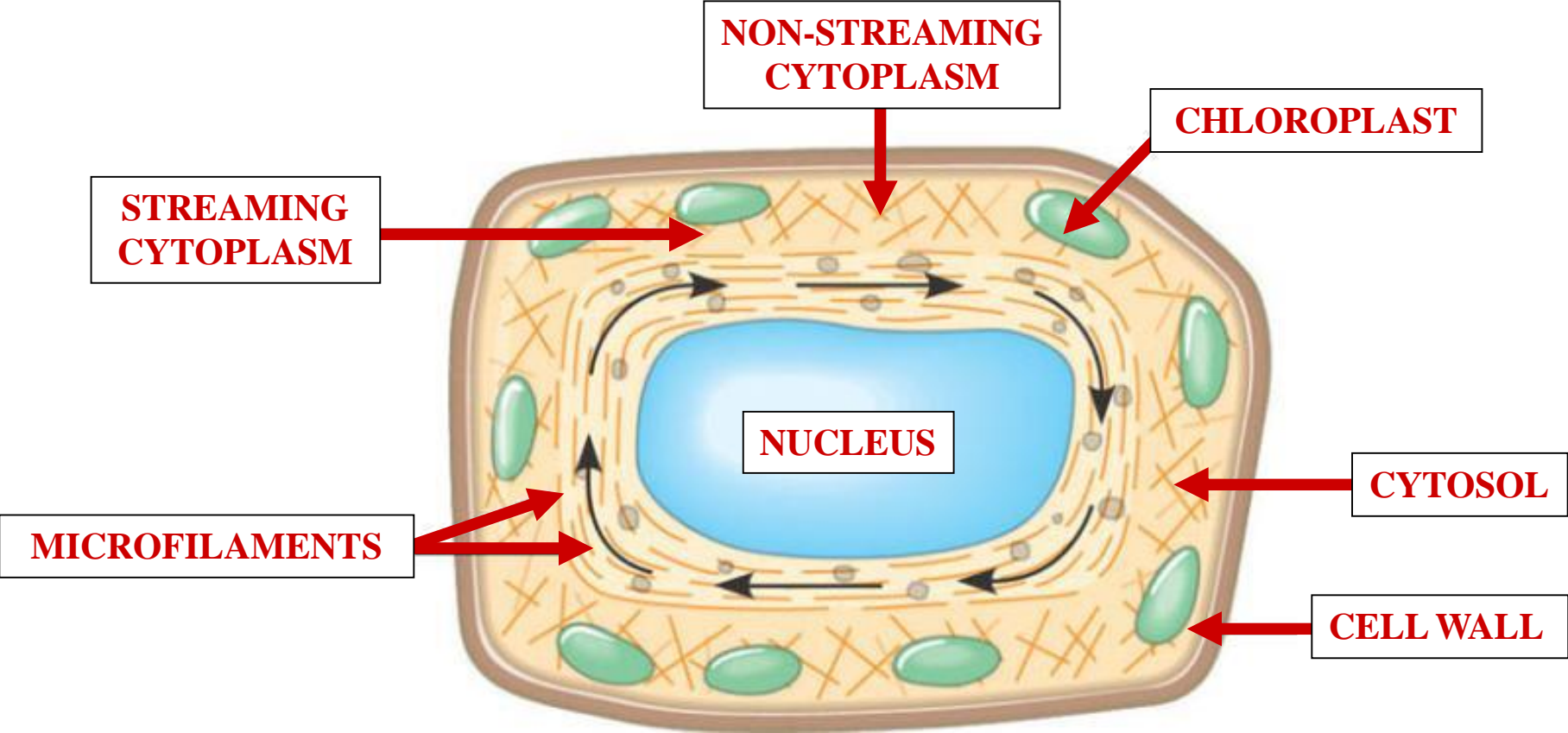
MIXES METABOLITES

**CYTOPLASMIC STREAMING
CYCLOSIS**

CYTOPLASMIC STREAMING CYCLOSIS



MX



**CYTOPLASMIC STREAMING
EQUALLY MIXES METABOLITES**

***CYTOPLASMIC
STREAMING
EQUALLY MIXES
METABOLITES***



***EFFICIENT
CELL
METABOLISM***

An electron micrograph showing a cross-section of a cell. The image displays various organelles, including a large nucleus with a prominent nucleolus, rough endoplasmic reticulum, and several mitochondria with visible internal folds (cristae). A red letter 'E' is enclosed in a small white box in the upper right corner, with a red arrow pointing downwards towards a specific structure within the cell.

E
↓

***ORGANIZATION
INCREASES***

*ENTROPY
DECREASES*

HOMEOSTASIS



ORGANELLES



ORGANELLES

SPECIALIZED ENTITIES
WITHIN CYTOSOL

ORGANELLES



ORGANELLES

SPECIALIZED ENTITIES

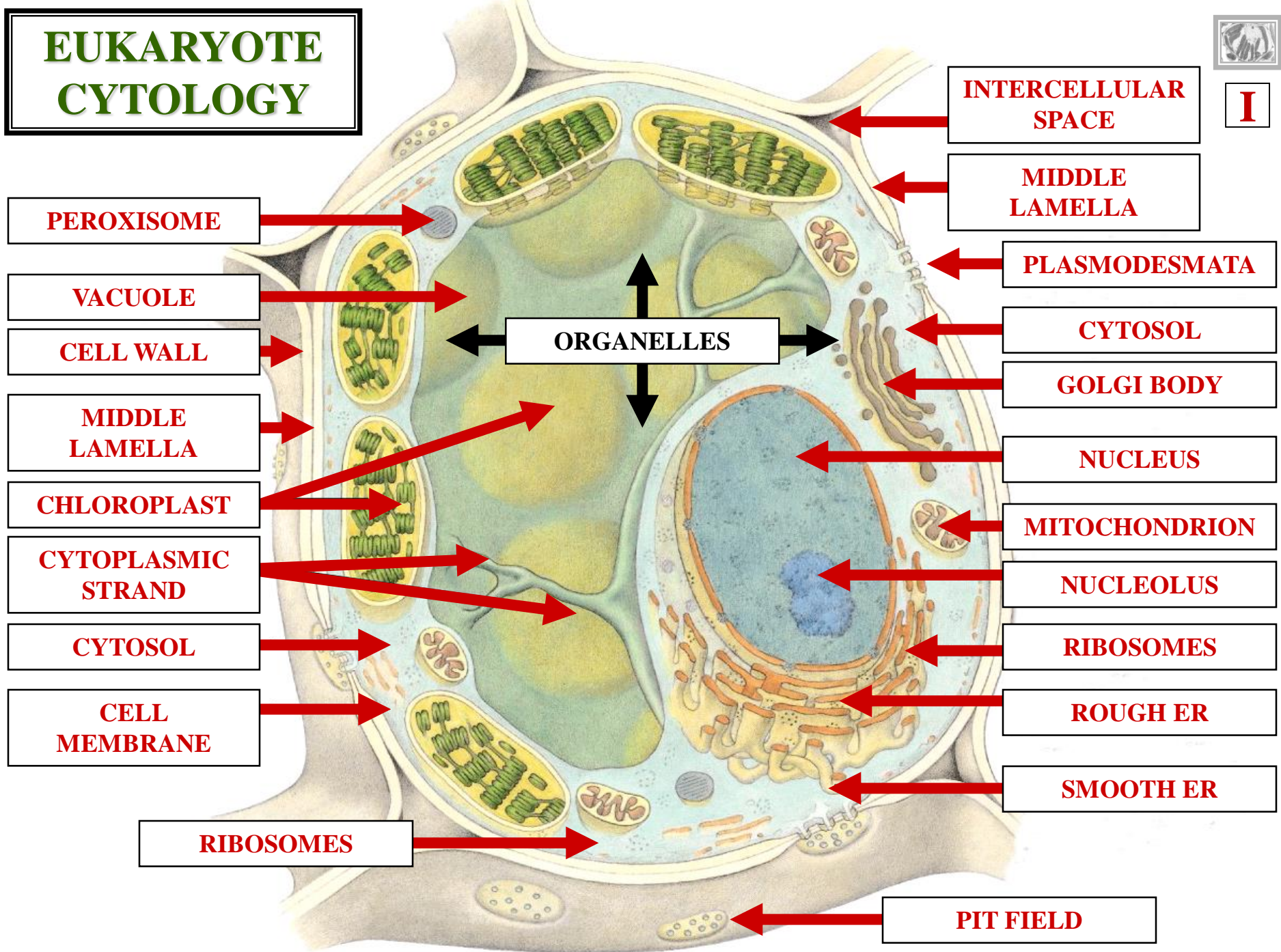
ISOLATE

NON-COMPATIBLE

BIO-CHEMICAL RXTS

ORGANELLES

EUKARYOTE CYTOLOGY



ORGANELLES

ISOLATE

NON-COMPATIBLE

BIO-CHEM RXTS

***EFFICIENT
CELL
METABOLISM***



HOMEOSTASIS



EUKARYOTE ORGANELLES

EUKARYOTE ORGANELLE TYPES

**EUKARYOTE
ORGANELLE TYPES**

DOUBLE MEMBRANE BOUND

**EUKARYOTE
ORGANELLE TYPES**

**EUKARYOTE
ORGANELLE TYPES**

**DOUBLE MEMBRANE BOUND
SINGLE MEMBRANE BOUND**

**EUKARYOTE
ORGANELLE TYPES**



EUKARYOTE ORGANELLE TYPES

DOUBLE MEMBRANE BOUND
SINGLE MEMBRANE BOUND
NON-MEMBRANE BOUND

EUKARYOTE ORGANELLE TYPES

**DOUBLE
MEMBRANE
BOUND
ORGANELLES**

**DOUBLE
MEMBRANE
BOUND
ORGANELLE
TYPES**



DMBO
ORGANELLE TYPES

PLASTIDS

DMBO
ORGANELLE TYPES



DMBO
ORGANELLE TYPES

PLASTIDS

MITOCHONDRION

DMBO
ORGANELLE TYPES



DMBO

ORGANELLE TYPES

PLASTIDS

MITOCHONDRION

NUCLEUS

DMBO

ORGANELLE TYPES

PLASTIDS

PLASTIDS



PLASTIDS

PLANT CELLS ONLY

PLASTIDS



PLANT CELLS ONLY



PLASTID TYPES

PLASTID TYPES

PROPLASTID

PLASTID TYPES

PLASTID TYPES

PROPLASTID
LEUCOPLAST

PLASTID TYPES

PLASTID TYPES

PROPLASTID

LEUCOPLAST

CHROMOPLAST

PLASTID TYPES

PLASTID TYPES

PROPLASTID

LEUCOPLAST

CHROMOPLAST

CHLOROPLAST

PLASTID TYPES

PROPLASTID



PLASTIDS
PROPLASTID

NON-PIGMENTED
IMMATURE PLASTID

PLASTIDS
PROPLASTID

PLASTIDS

PROPLASTID



NON-PIGMENTED
IMMATURE PLASTID

DERIVES OTHER PLASTIDS

PLASTIDS

PROPLASTID

PLASTIDS TYPES



PROPLASTID

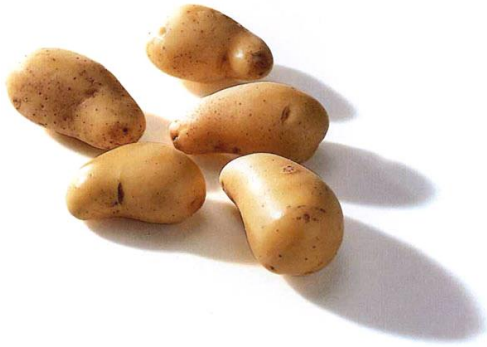
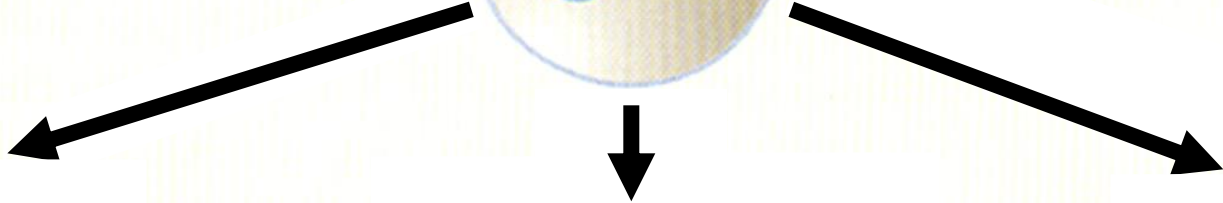


PLASTIDS TYPES

PROPLASTID



L



TUBER



LEAF



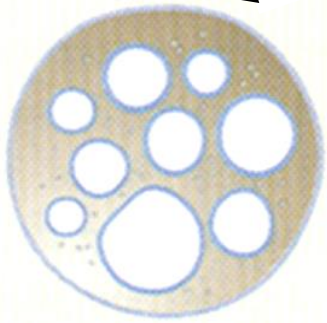
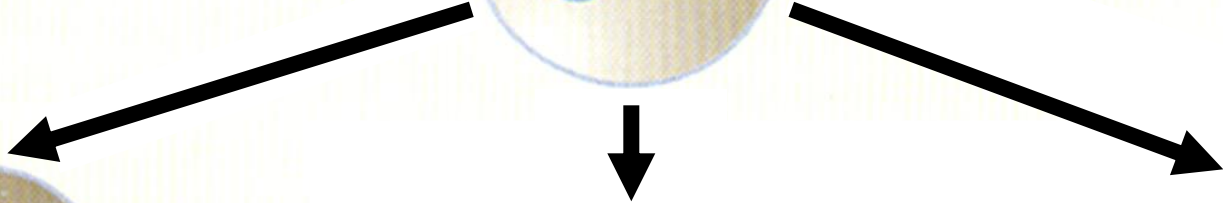
FRUIT

PLASTIDS TYPES

PROPLASTID



C



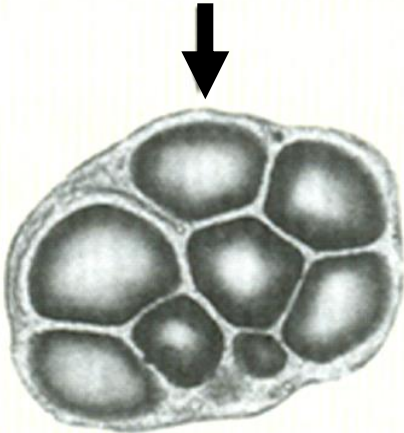
LEUCOPLAST



LEAF



FRUIT

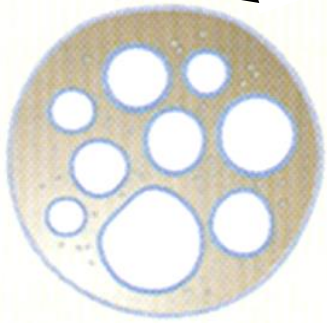
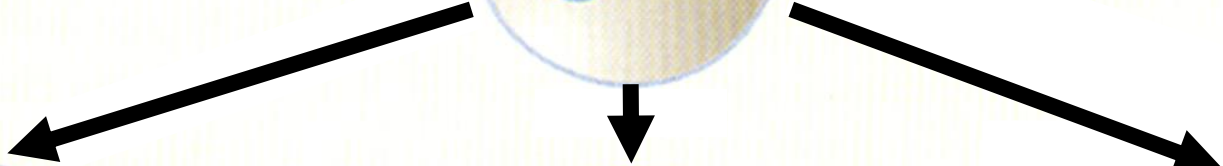
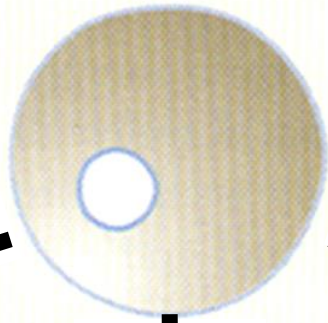


PLASTIDS TYPES

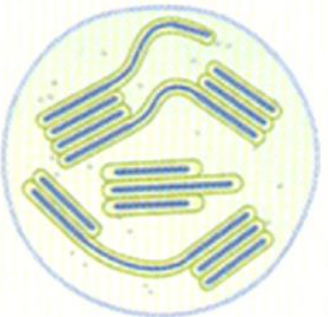
PROPLASTID



C



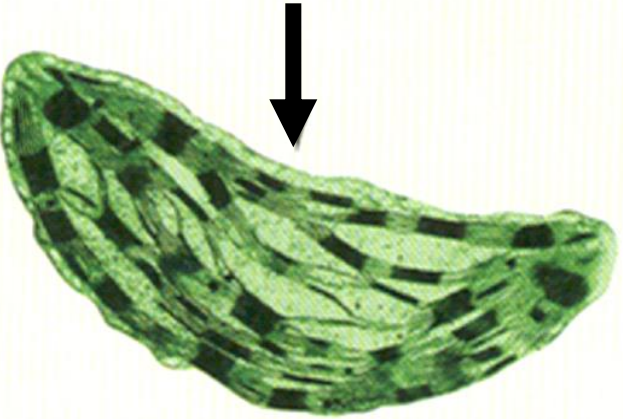
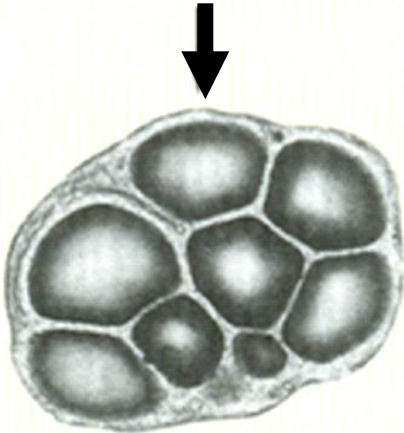
LEUCOPLAST



CHLOROPLAST



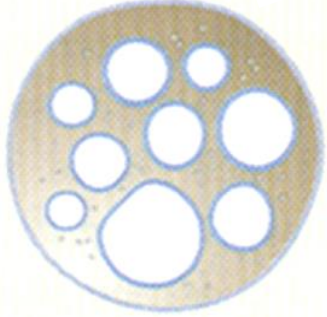
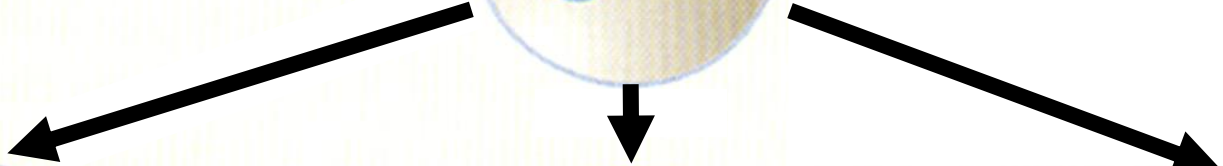
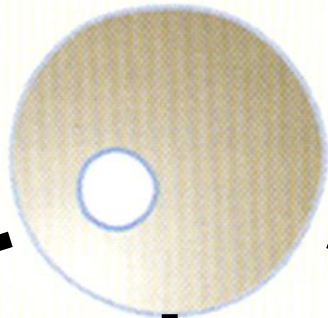
FRUIT



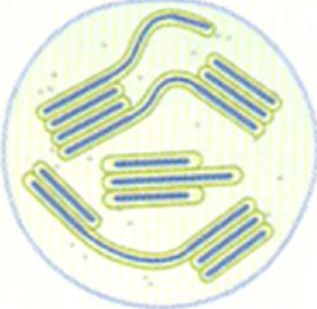
PLASTIDS TYPES

PROPLASTID

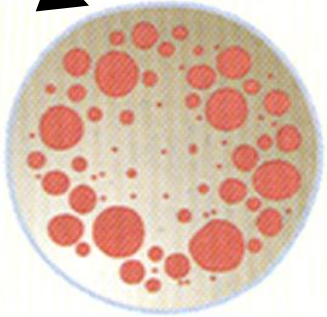
L
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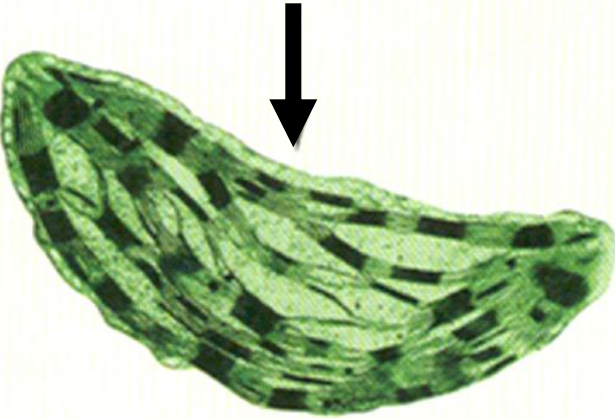
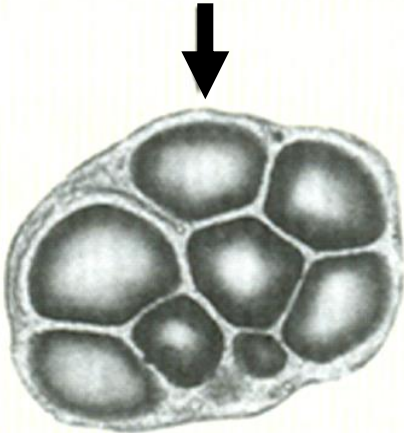
LEUCOPLAST



CHLOROPLAST



CHROMOPLAST



LEUCOPLAST



PLASTIDS
LEUCOPLAST

NON-PIGMENTED
PLASTID

PLASTIDS
LEUCOPLAST

PLASTIDS
LEUCOPLAST



NON-PIGMENTED
PLASTID

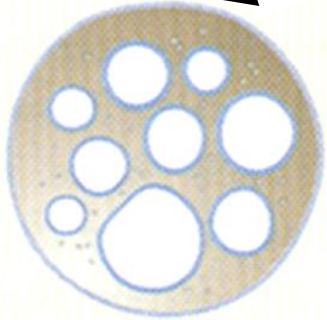
STORES STARCH

PLASTIDS
LEUCOPLAST

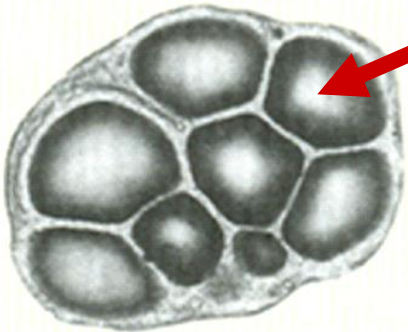
PLASTIDS TYPES



PROPLASTID



LEUCOPLAST



STARCH GRAIN



MAPLE LEAF

A large, detailed image of a green maple leaf with prominent veins and serrated edges, set against a blue sky with white clouds. The leaf is the central focus of the slide.

PHOTOSYNTHESIS

PHOTOSYNTHESIS

G



WATER

CO₂

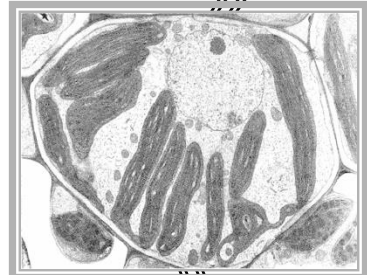
LIGHT ENERGY

PHOTO

ATMOSPHERE

E-

PHOTOLYSIS



LT RXT
THYLAKOID

CHEMICAL ENERGY

DK RXT
STROMA

CHLOROPLAST

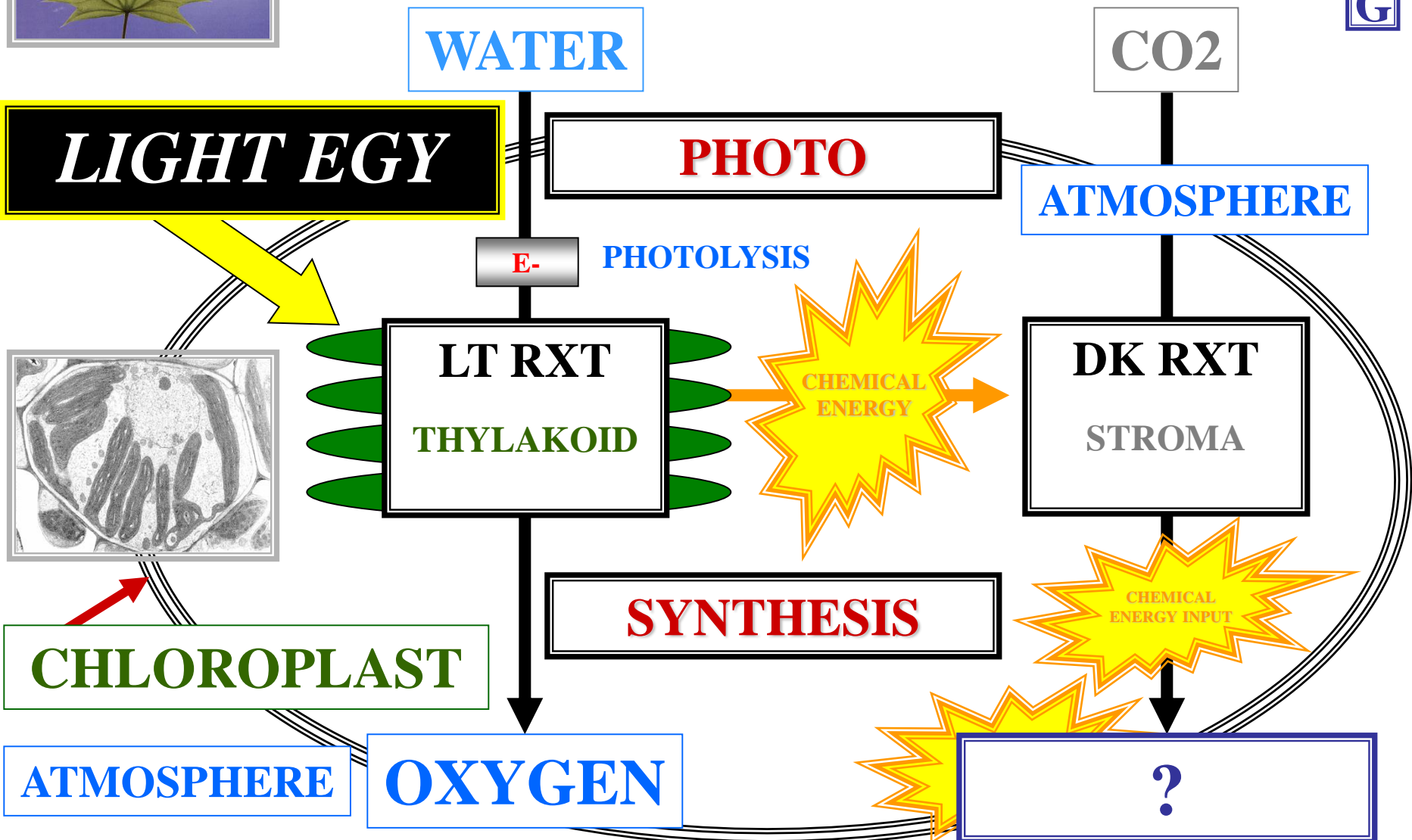
SYNTHESIS

CHEMICAL ENERGY INPUT

ATMOSPHERE

OXYGEN

?



PHOTOSYNTHESIS

S



WATER

CO₂

LIGHT ENERGY

PHOTO

ATMOSPHERE

E-

PHOTOLYSIS



LT RXT

THYLAKOID

CHEMICAL ENERGY

DK RXT

STROMA

CHLOROPLAST

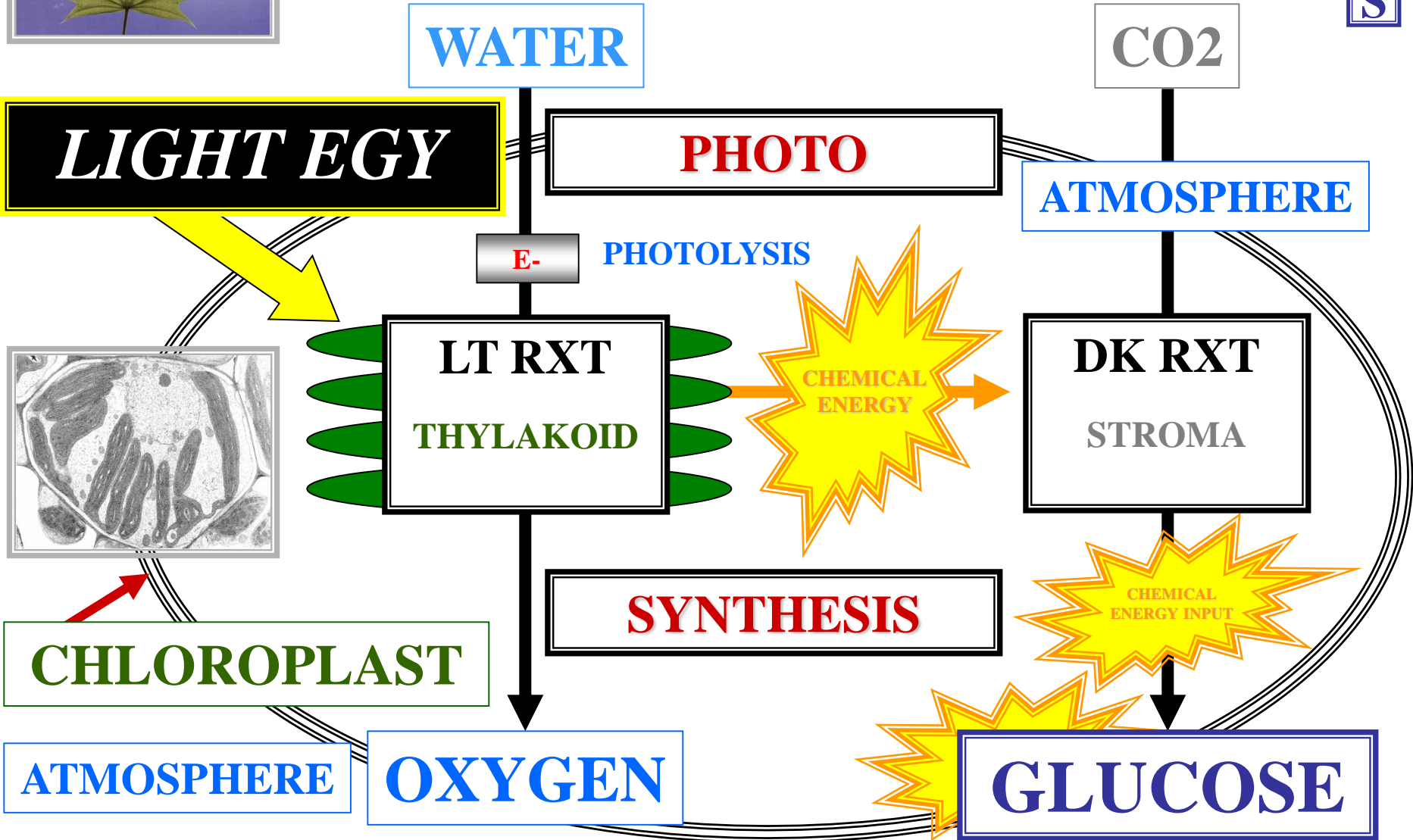
SYNTHESIS

CHEMICAL ENERGY INPUT

ATMOSPHERE

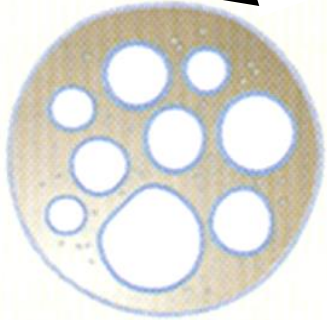
OXYGEN

GLUCOSE



PLASTIDS TYPES

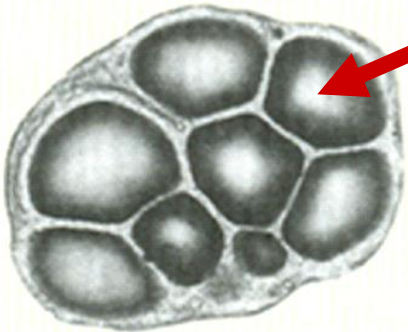
PROPLASTID



LEUCOPLAST

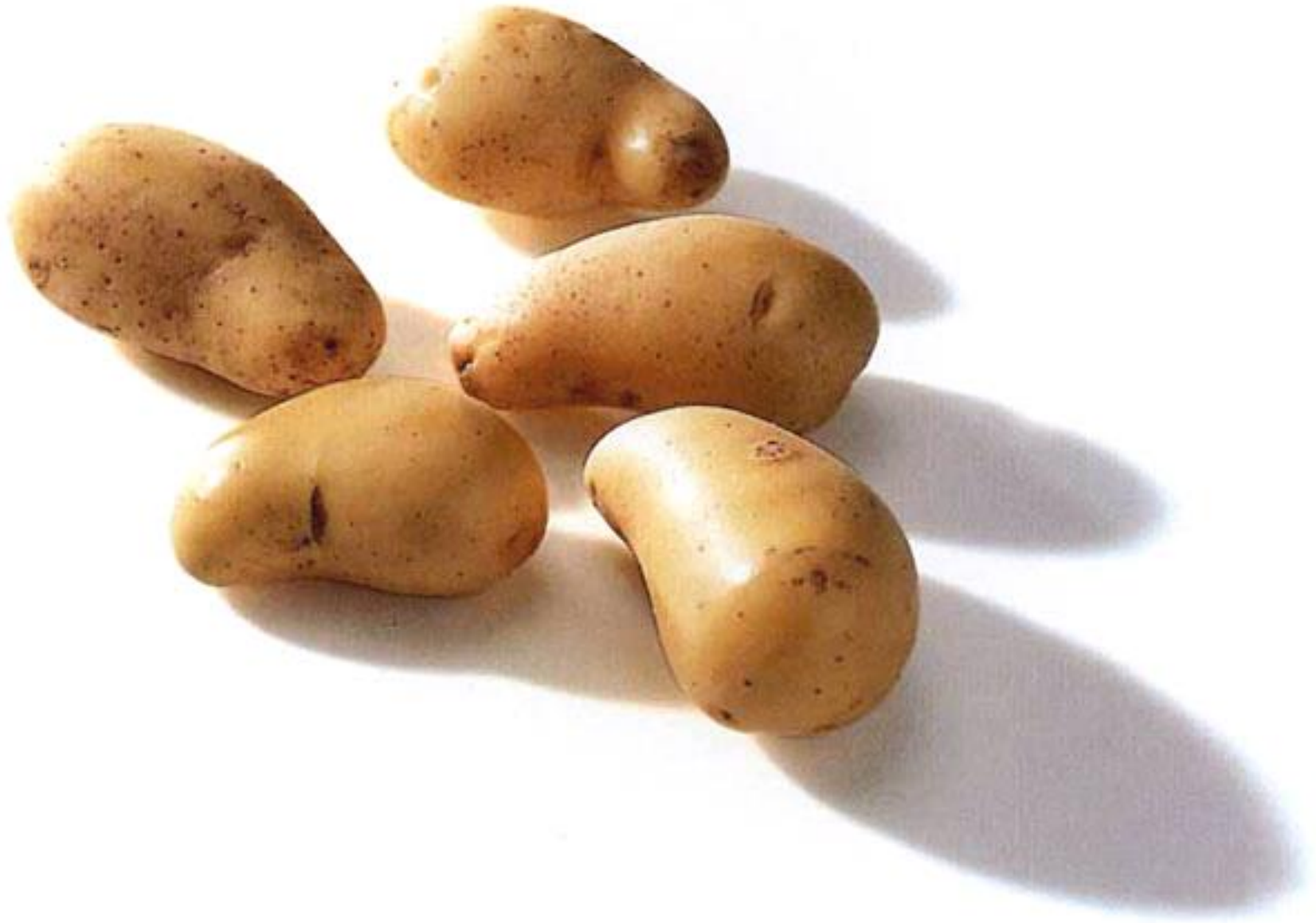


STARCH GRAIN



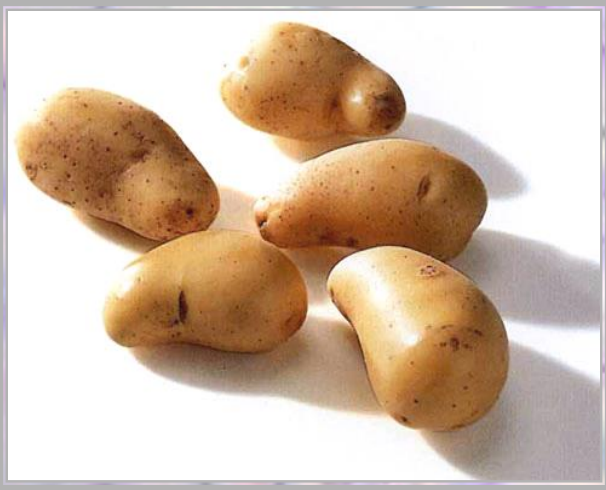
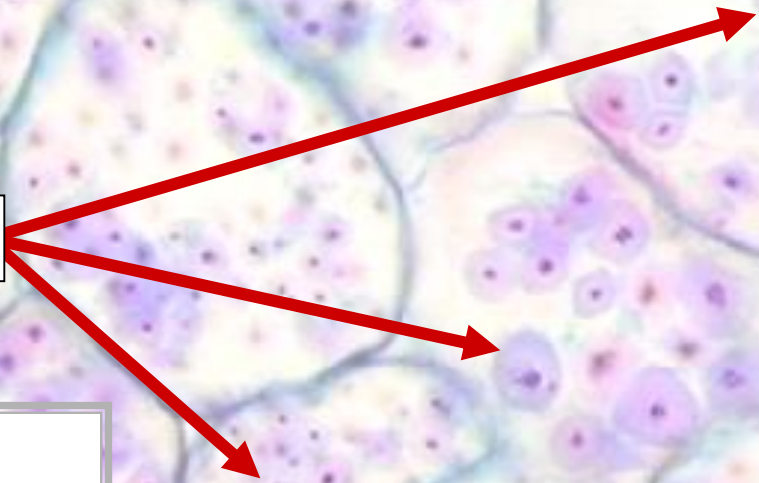


S



L

STRACH GRAINS

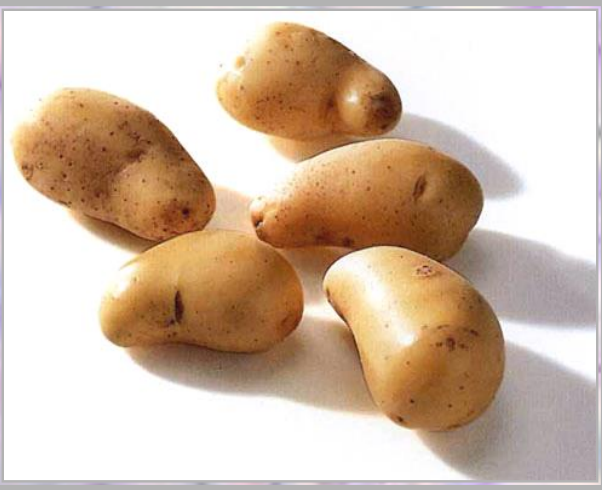
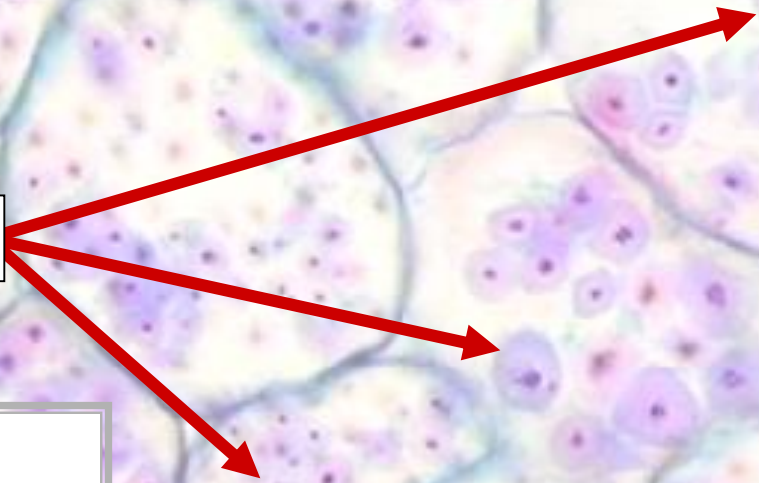


C.S.

SS



LEUCOPLASTS

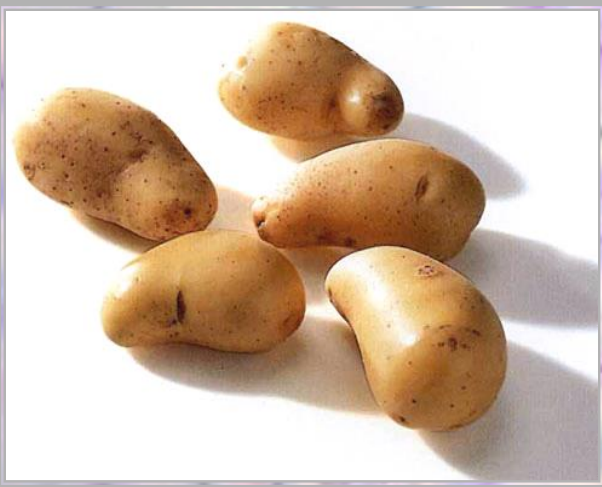
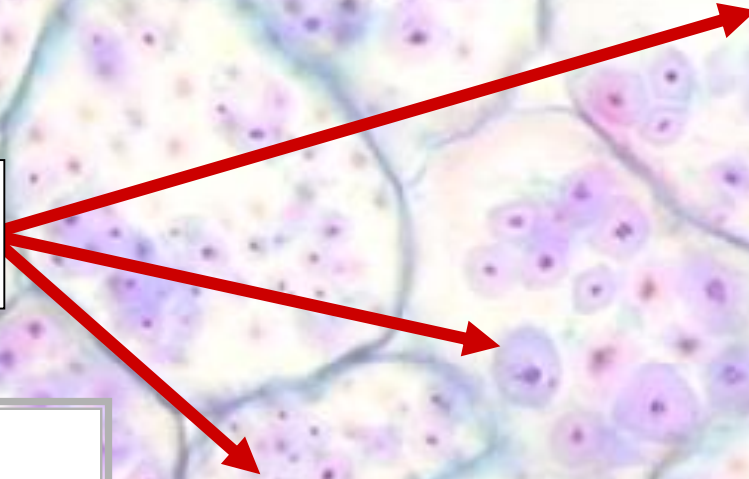


C.S.

^

C

**LEUCOPLASTS
STORE STARCH**



C.S.

CHROMOPLAST

PLASTIDS CHROMOPLAST



PIGMENTED PLASTID

PLASTIDS CHROMOPLAST



PLASTIDS
CHROMOPLAST

PIGMENTED PLASTID

CAROTENOID PIGMENTS
DOMINATE

PLASTIDS
CHROMOPLAST

PLASTIDS

CHROMOPLAST

PIGMENTED PLASTID

CAROTENOID PIGMENTS

DOMINATE

ATTRACT ANIMALS

PLASTIDS

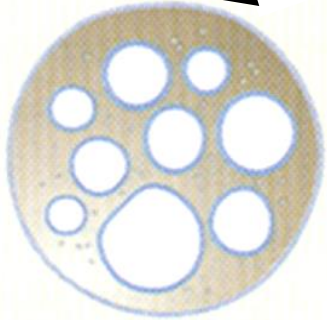
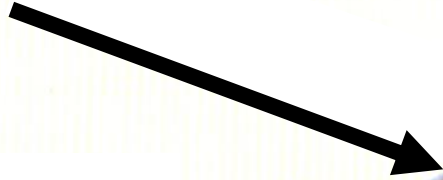
CHROMOPLAST



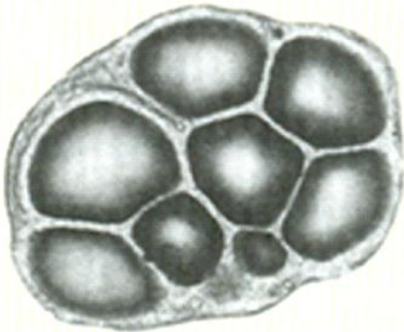
PLASTIDS TYPES



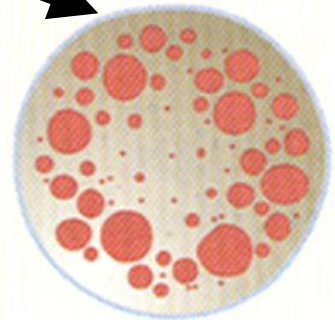
PROPLASTID



LEUCOPLAST



CHROMOPLAST





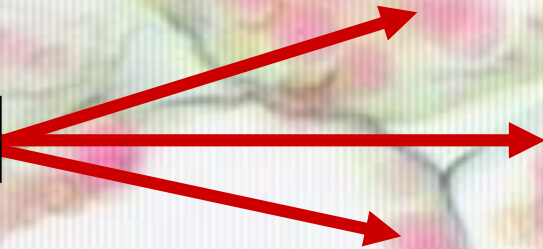
C



C

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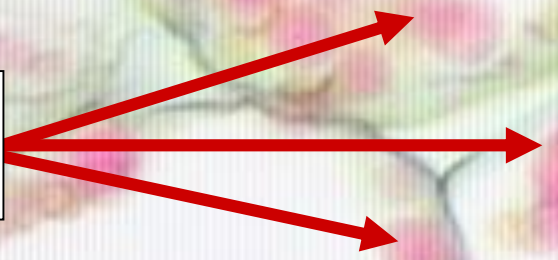
CHROMOPLASTS



C.S.



**CHROMOPLASTS
CAROTENOIDS**



C.S.

