

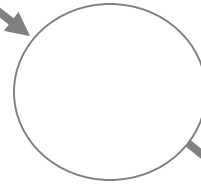
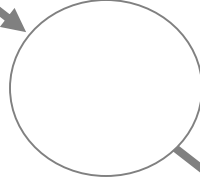
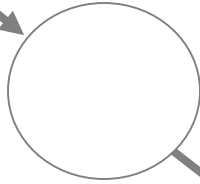
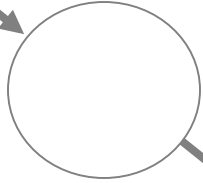
ELECTRON TRANSPORT CHAIN

#2

ELECTRON TRANSPORT CHAIN #2



THYLAKOID GRANUM



 = ELECTRON TRANSPORT CHAIN COMPONENT

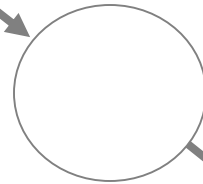
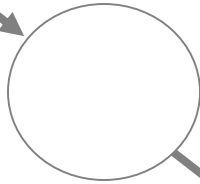
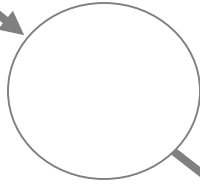
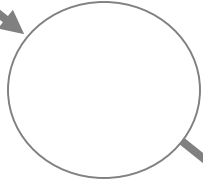
 = CHEMICAL ENERGY

 = DISSIPATED HEAT ENERGY

ELECTRON TRANSPORT CHAIN #2



THYLAKOID GRANUM



CHLOROPLAST
THYLAKOID
GRANUM

REDOX RXTS



= CHEMICAL ENERGY

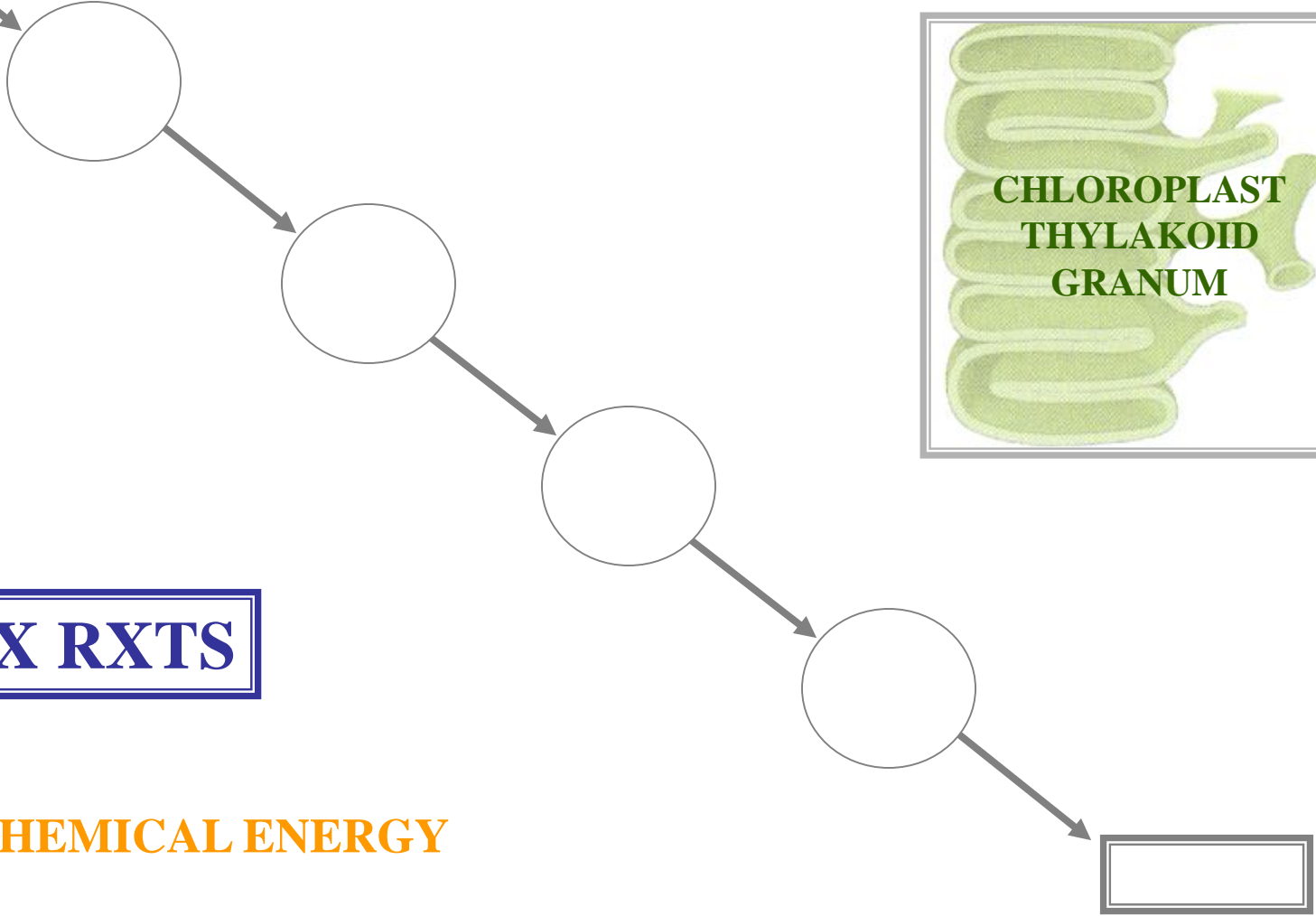


= DISSIPATED HEAT ENERGY

ELECTRON TRANSPORT CHAIN #2

E-

THYLAKOID GRANUM



REDOX RXTS

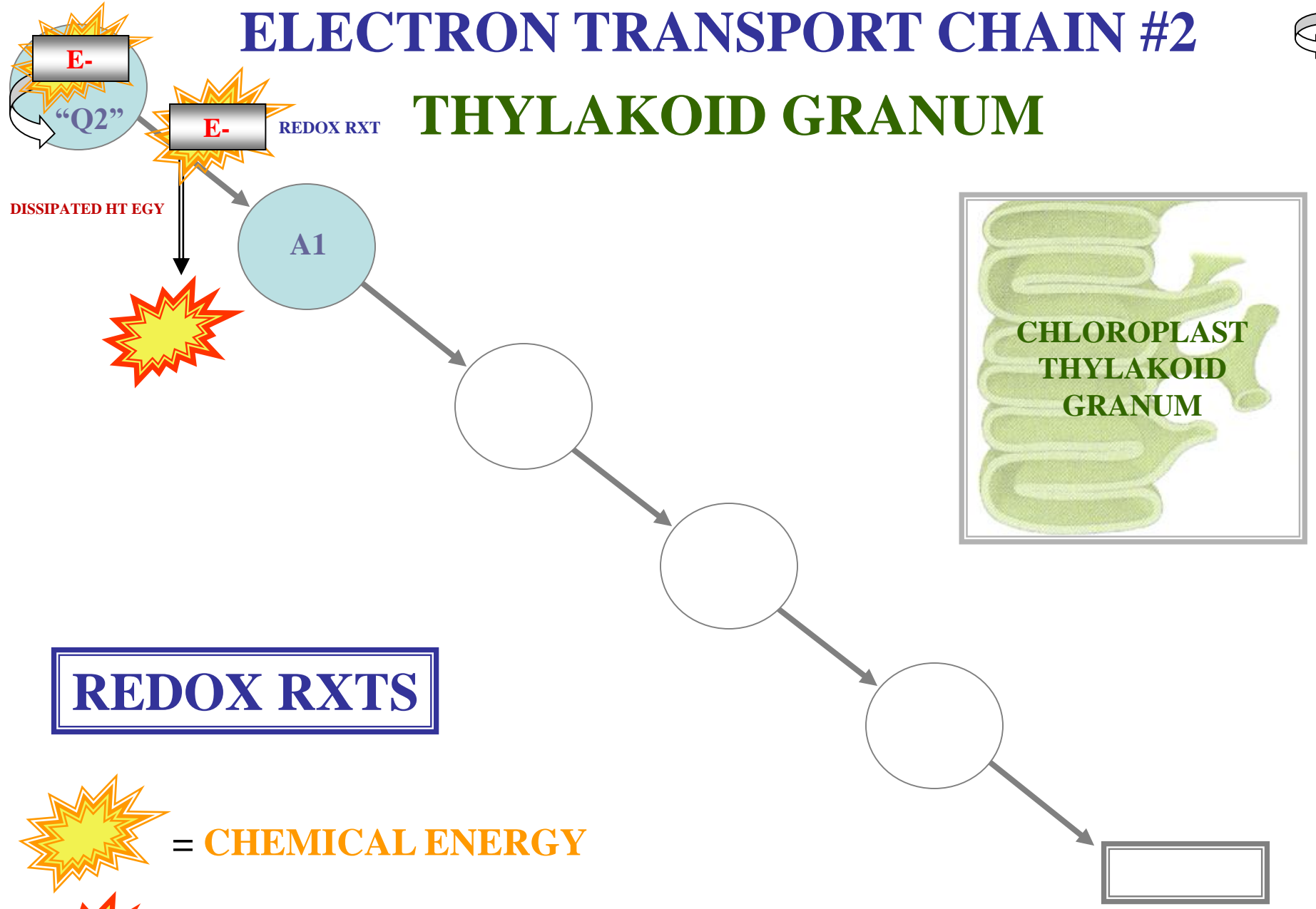
 = CHEMICAL ENERGY

 = DISSIPATED HEAT ENERGY

ELECTRON TRANSPORT CHAIN #2



THYLAKOID GRANUM



DISSIPATED HT EGY

REDOX RXTS



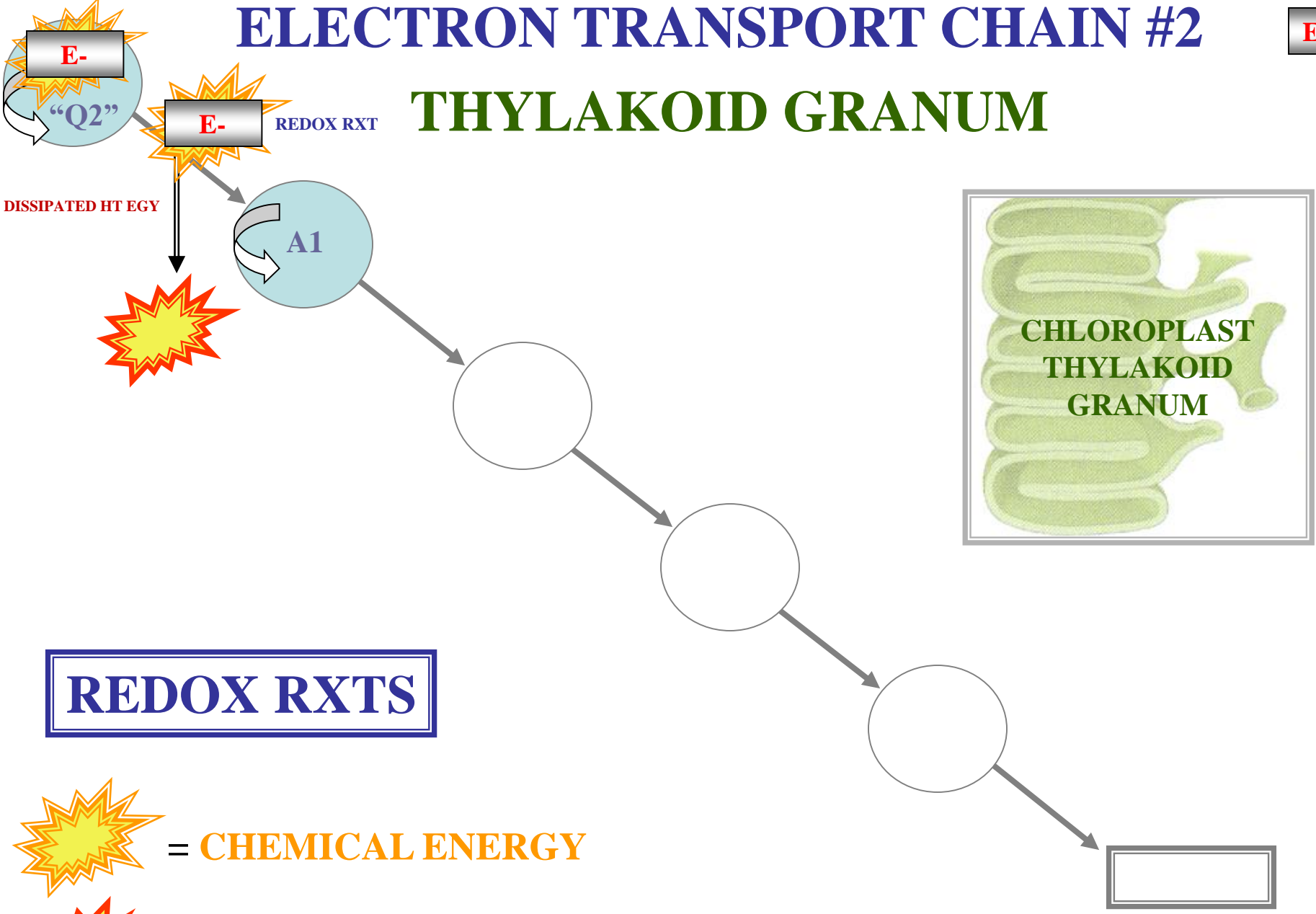
 = CHEMICAL ENERGY

 = DISSIPATED HEAT ENERGY

ELECTRON TRANSPORT CHAIN #2

E-

THYLAKOID GRANUM



REDOX RXTS

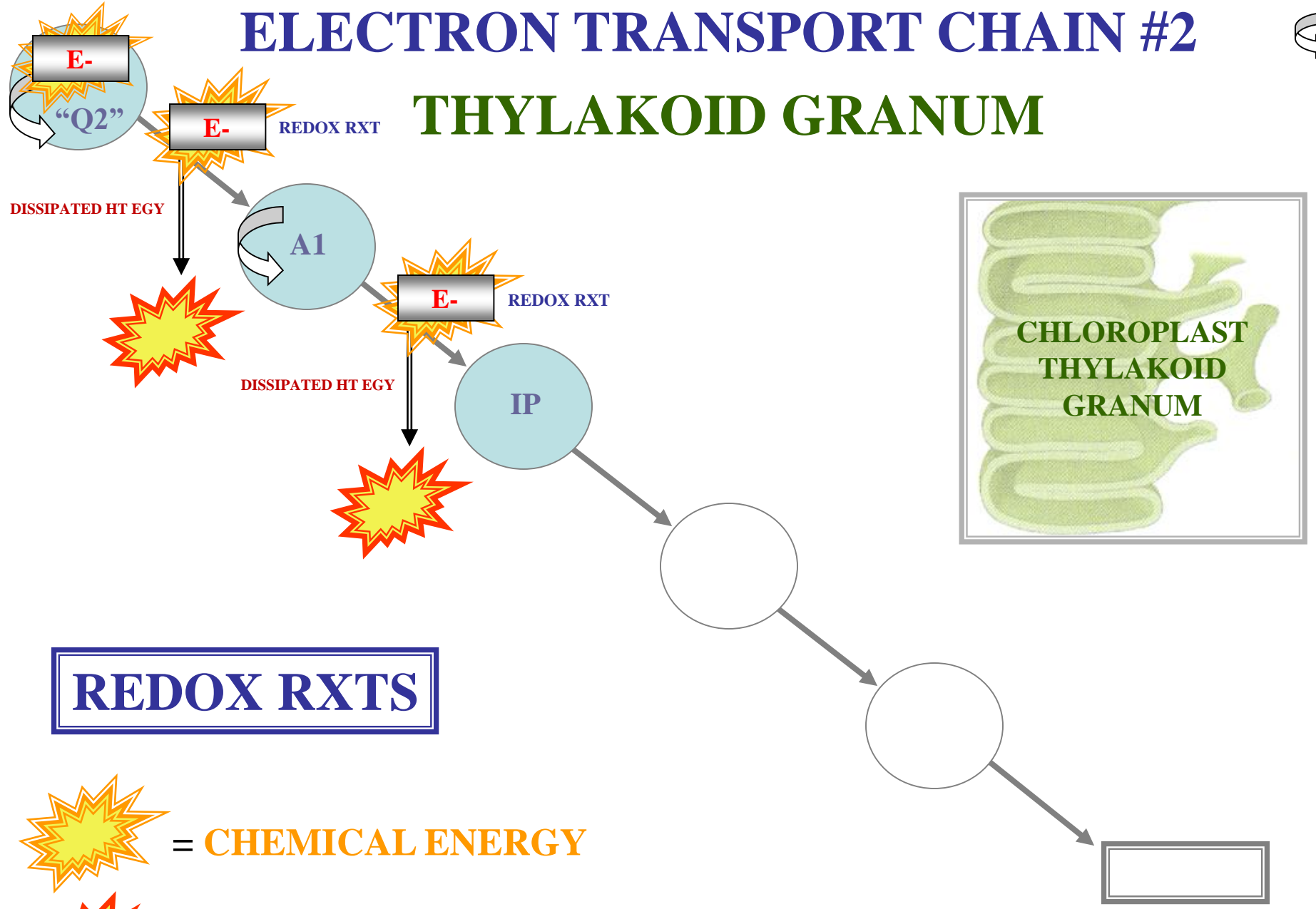
 = CHEMICAL ENERGY

 = DISSIPATED HEAT ENERGY

ELECTRON TRANSPORT CHAIN #2



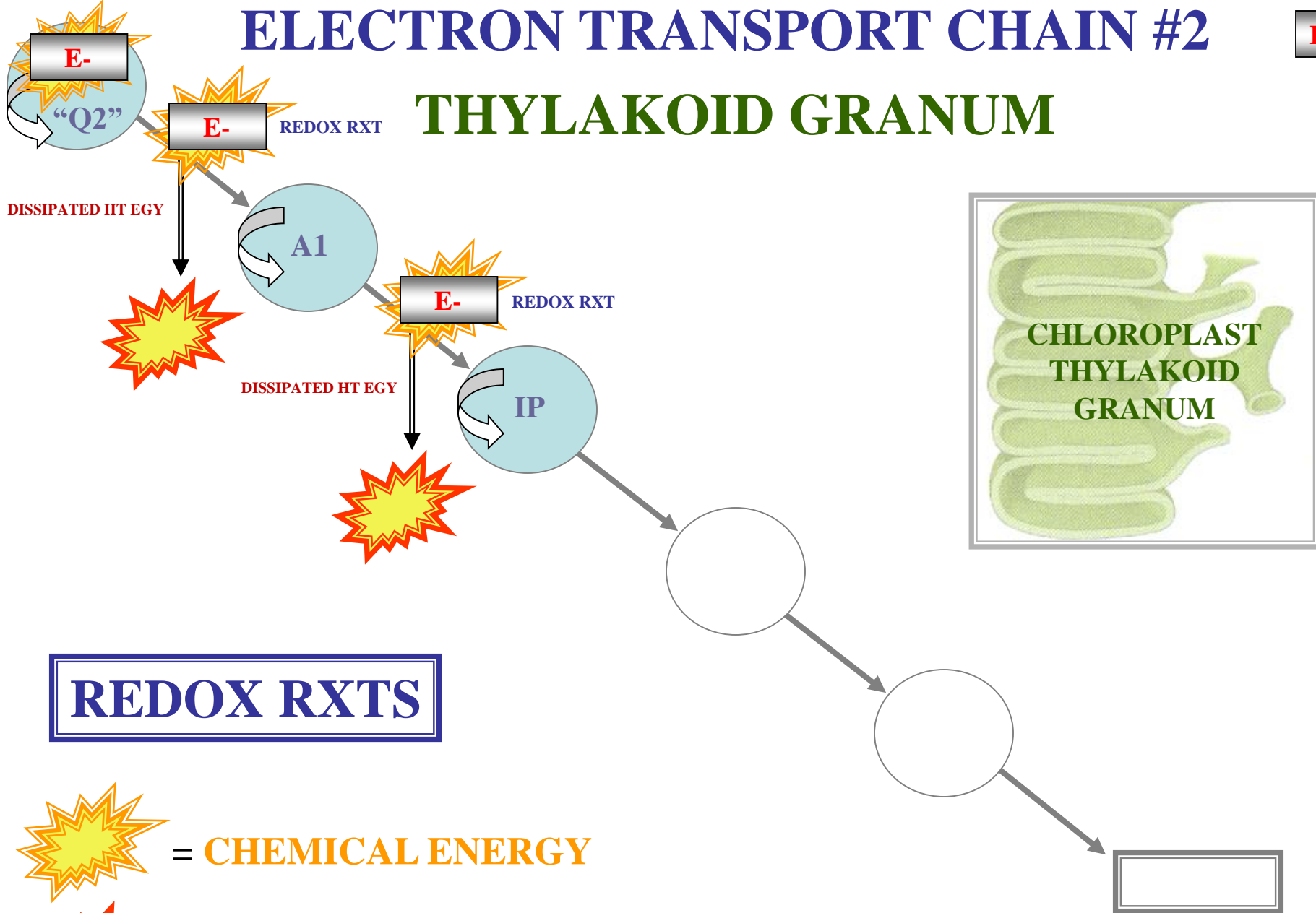
THYLAKOID GRANUM



ELECTRON TRANSPORT CHAIN #2

E-

THYLAKOID GRANUM



REDOX RXTS



= **CHEMICAL ENERGY**

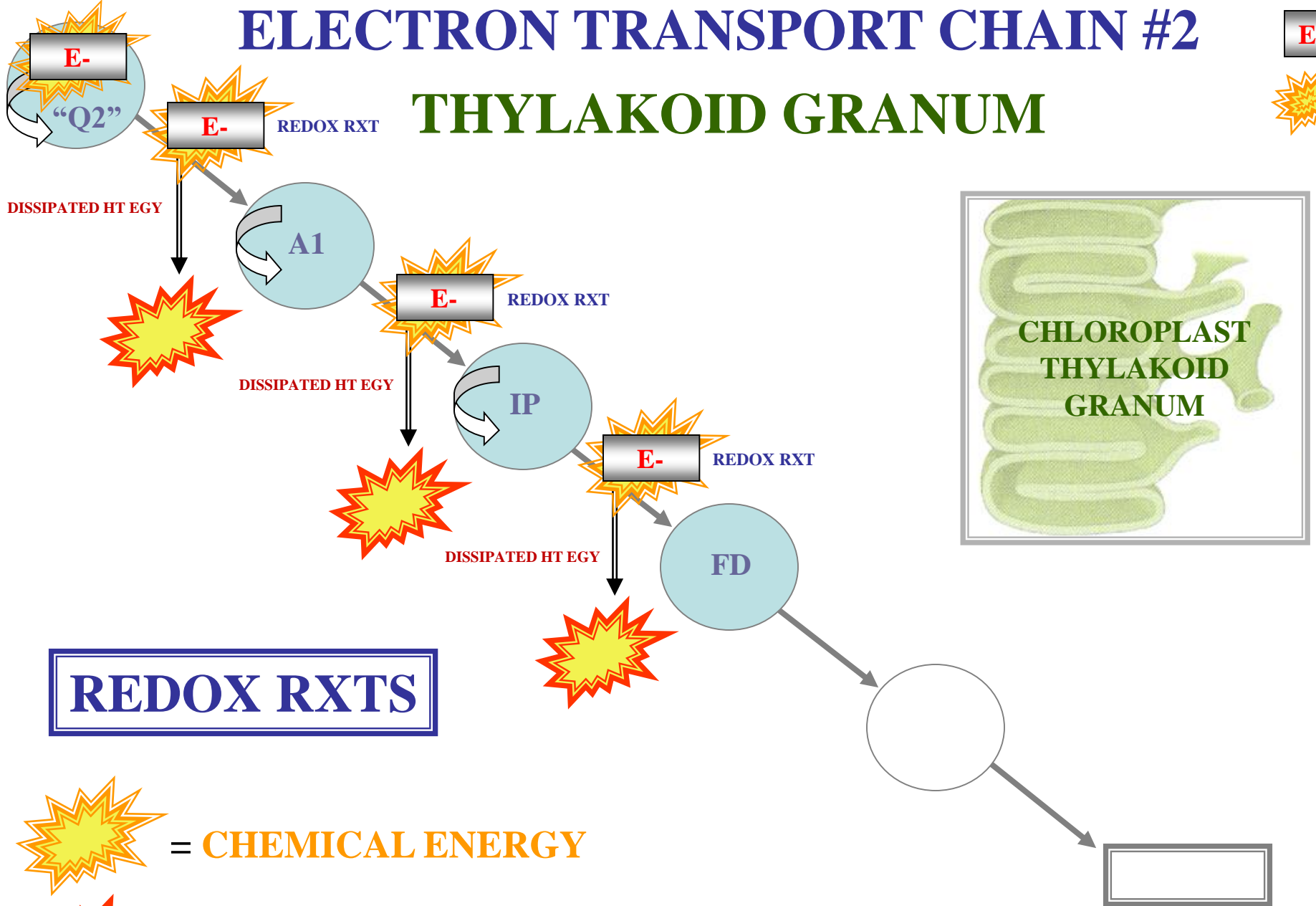


= **DISSIPATED HEAT ENERGY**

ELECTRON TRANSPORT CHAIN #2

E-

THYLAKOID GRANUM



= CHEMICAL ENERGY

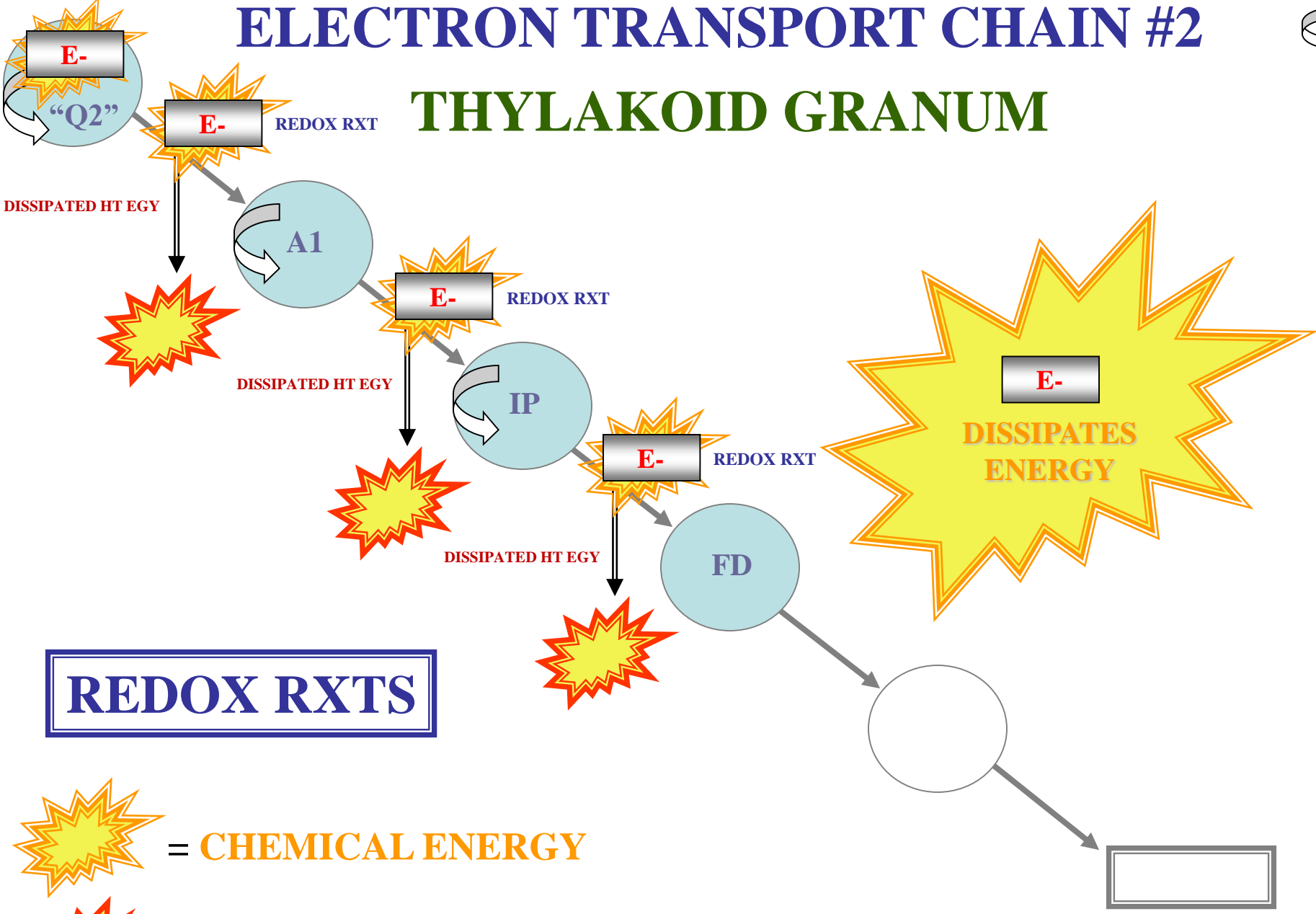


= DISSIPATED HEAT ENERGY

ELECTRON TRANSPORT CHAIN #2



THYLAKOID GRANUM



REDOX RXTS

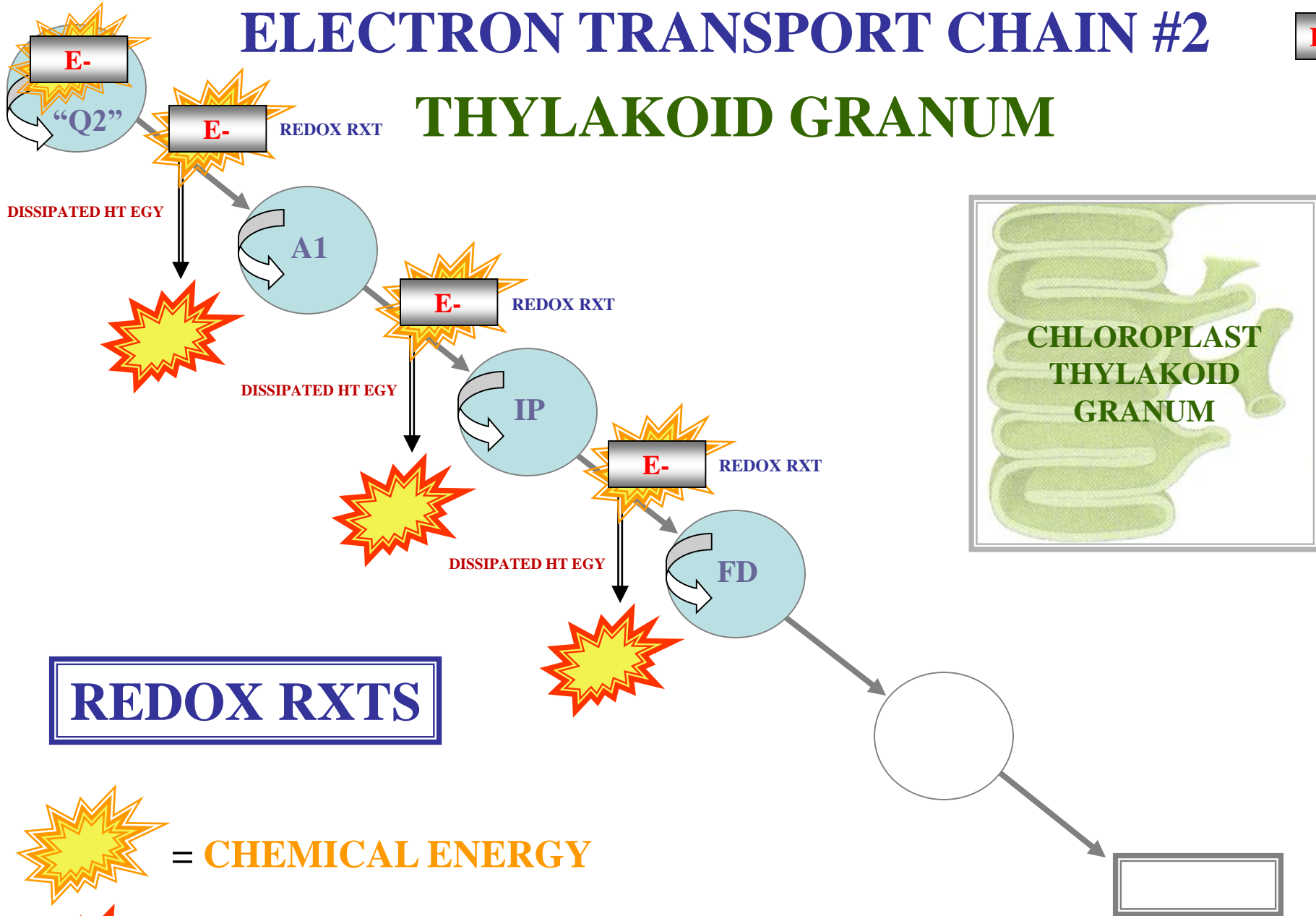
 = CHEMICAL ENERGY

 = DISSIPATED HEAT ENERGY

ELECTRON TRANSPORT CHAIN #2

E-

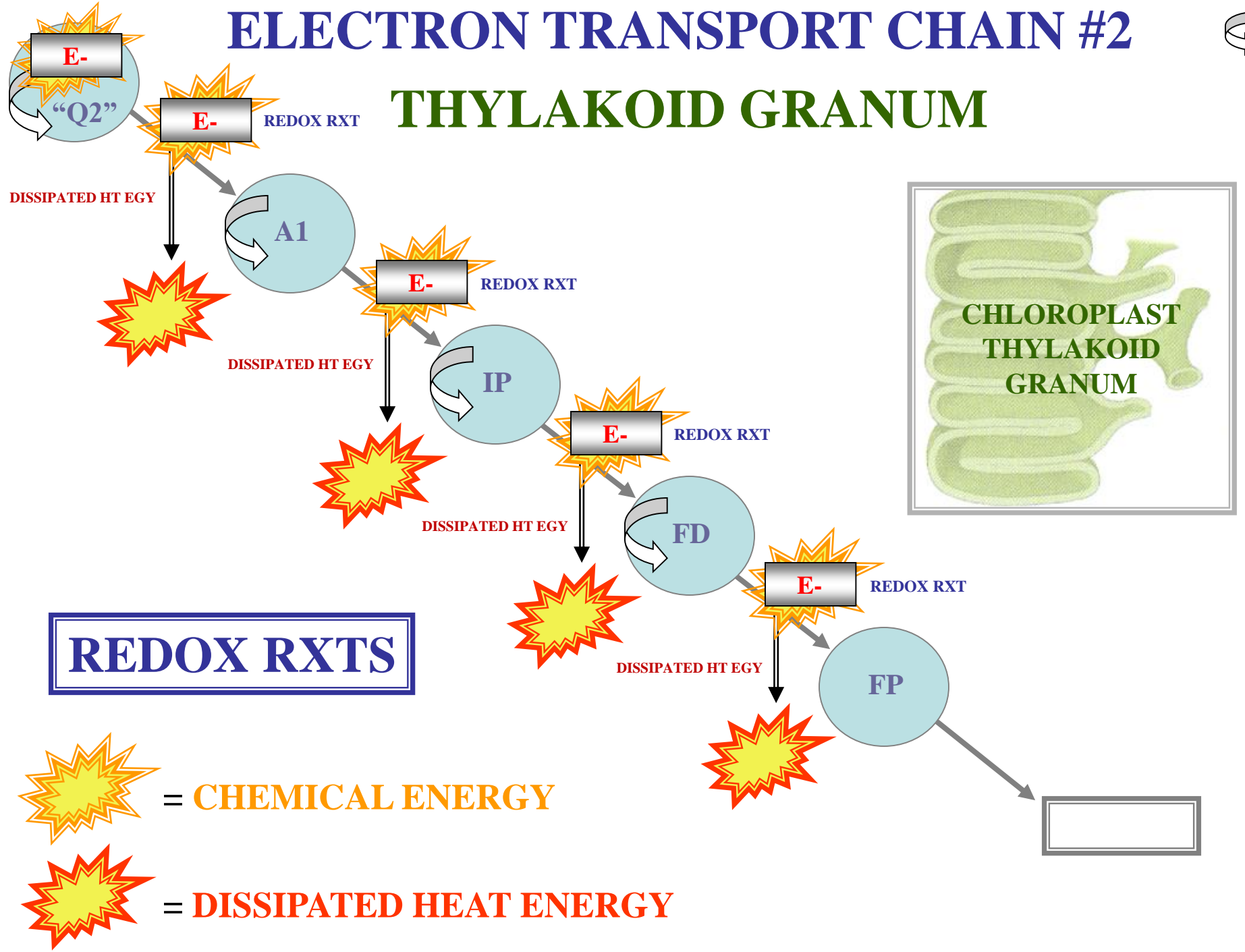
THYLAKOID GRANUM



ELECTRON TRANSPORT CHAIN #2



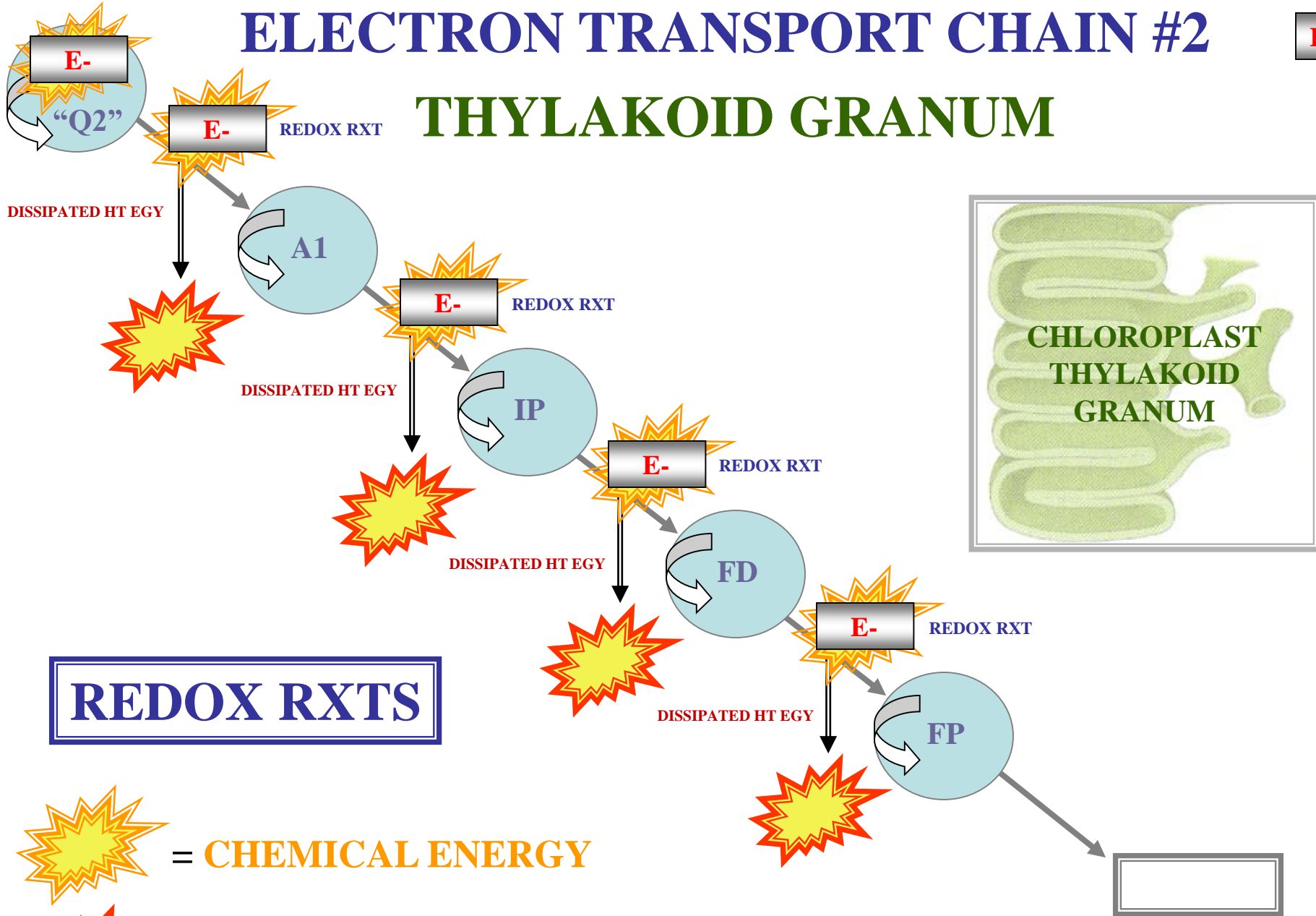
THYLAKOID GRANUM



ELECTRON TRANSPORT CHAIN #2

E-

THYLAKOID GRANUM



REDOX RXTS

 = CHEMICAL ENERGY

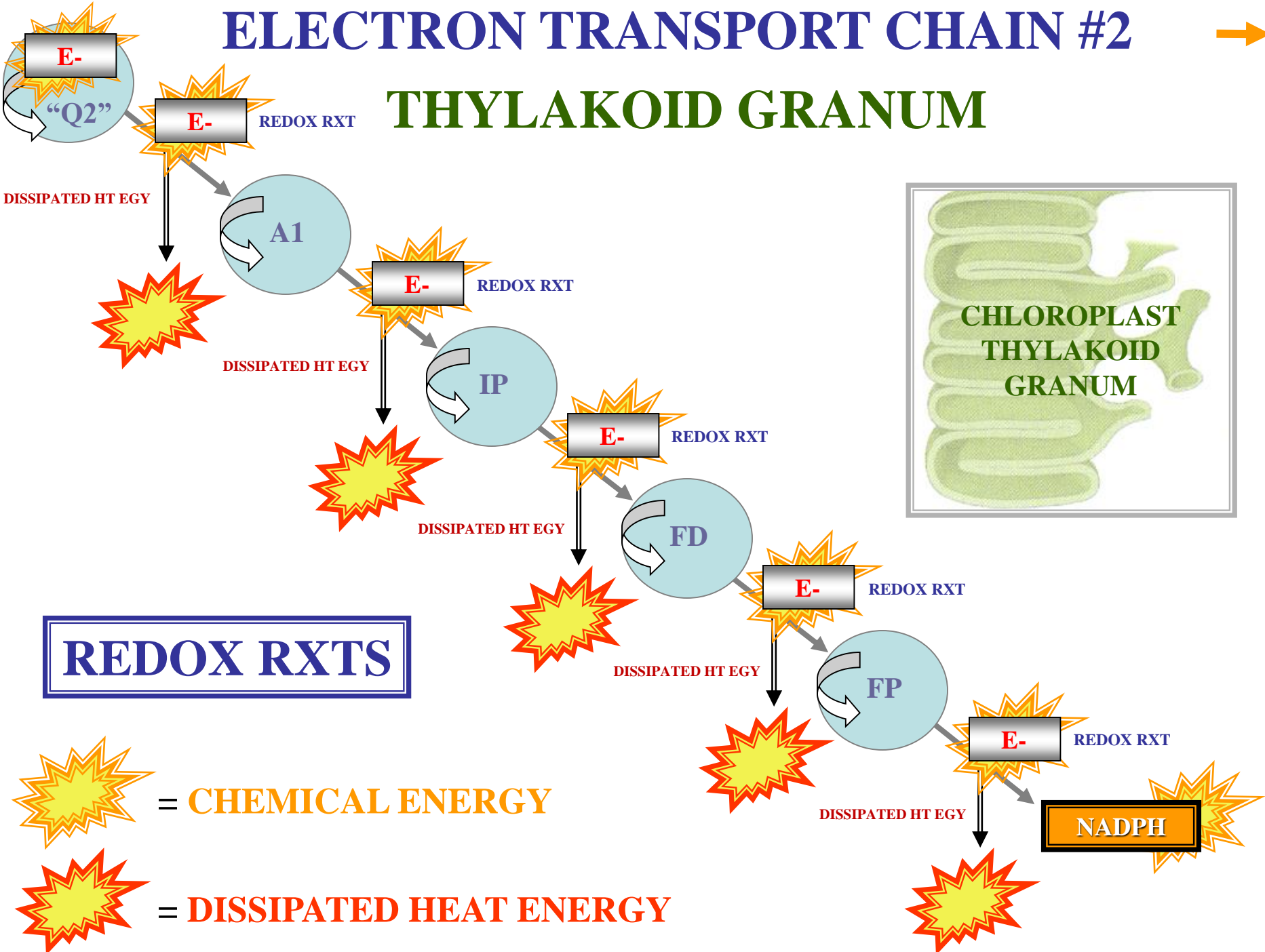
 = DISSIPATED HEAT ENERGY



ELECTRON TRANSPORT CHAIN #2



THYLAKOID GRANUM



REDOX RXTS

= CHEMICAL ENERGY

= DISSIPATED HEAT ENERGY

NADPH

PHOTOSYNTHESIS

DK



WATER

LIGHT ENERGY

E-

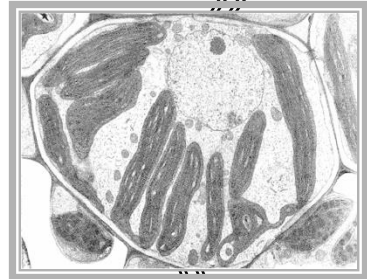
PHOTOLYSIS

LT RXT

THYLAKOID
GRANUM

NADPH

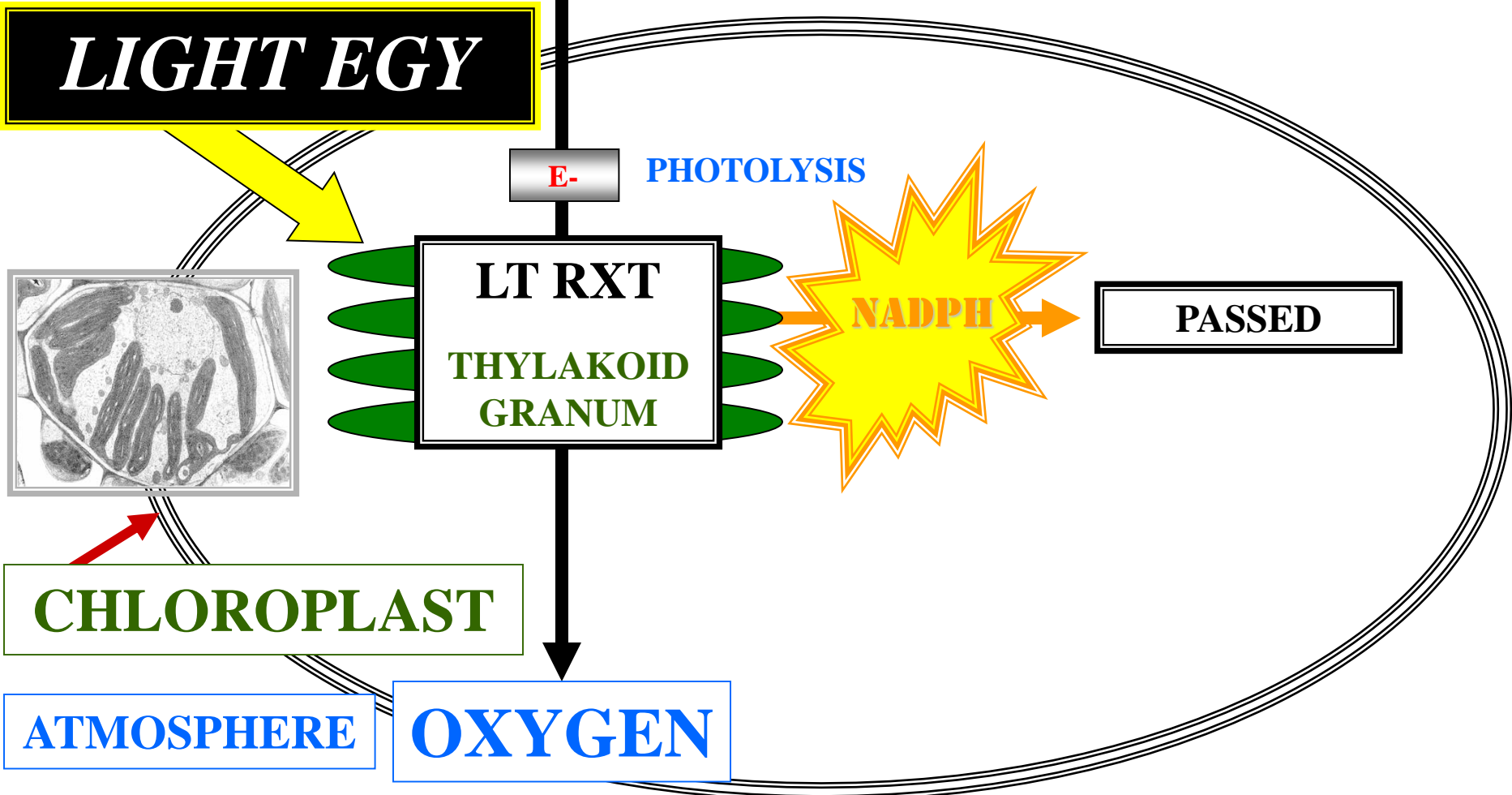
PASSED



CHLOROPLAST

ATMOSPHERE

OXYGEN



PHOTOSYNTHESIS



N

+

WATER

LIGHT ENERGY

E-

PHOTOLYSIS

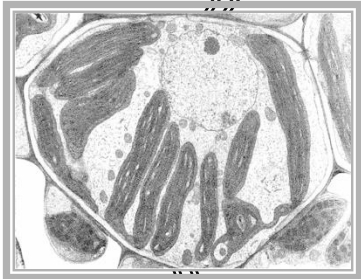
LT RXT

THYLAKOID
GRANUM

NADPH

DK RXT

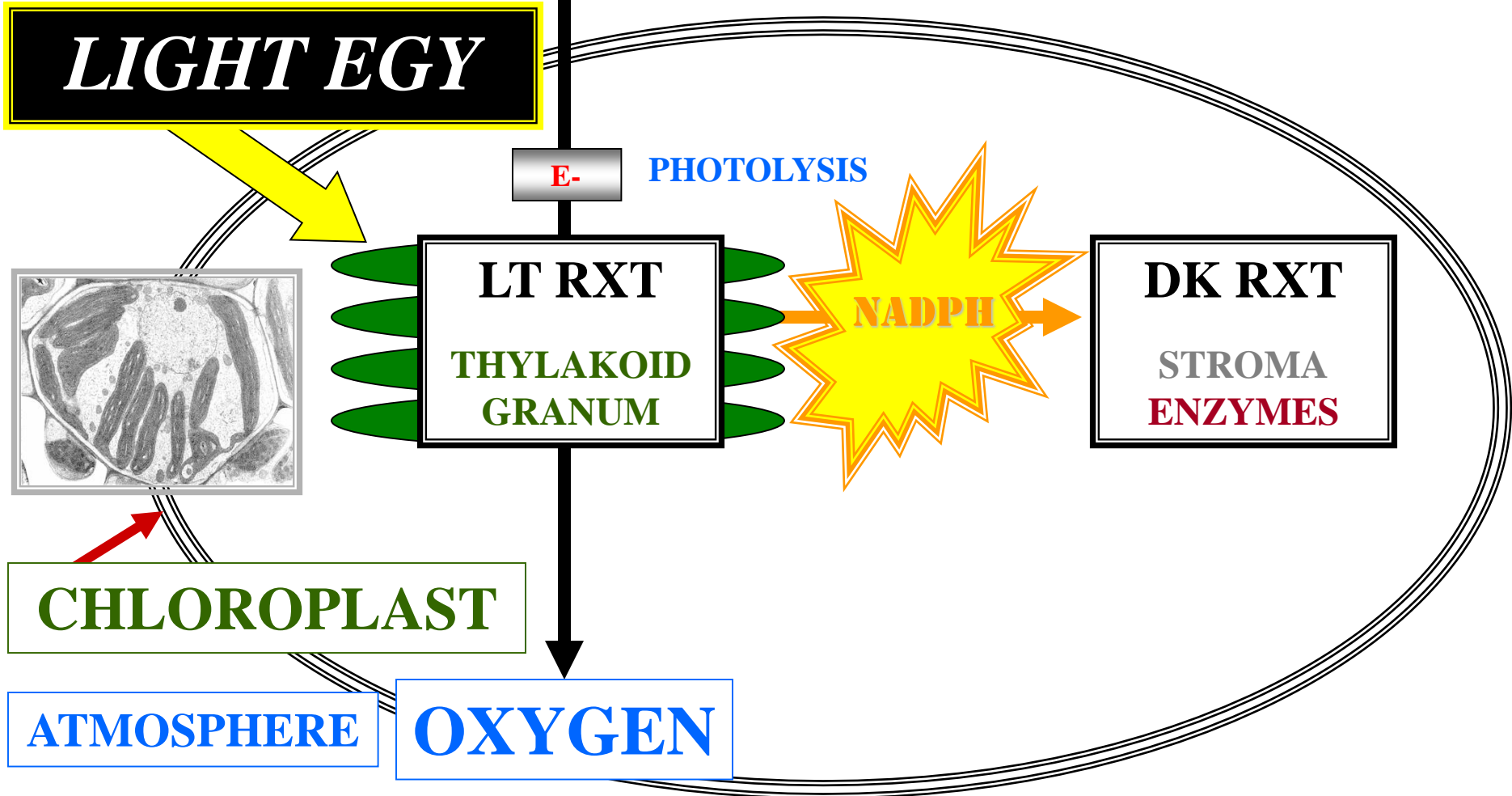
STROMA
ENZYMES



CHLOROPLAST

ATMOSPHERE

OXYGEN



NADPH



NADPH

**NICOTINAMIDE ADENINE
DINUCLEOTIDE PHOSPHATE**

NADPH



NADPH

**NICOTINAMIDE ADENINE
DINUCLEOTIDE PHOSPHATE**

ENERGY MOLECULE

NADPH

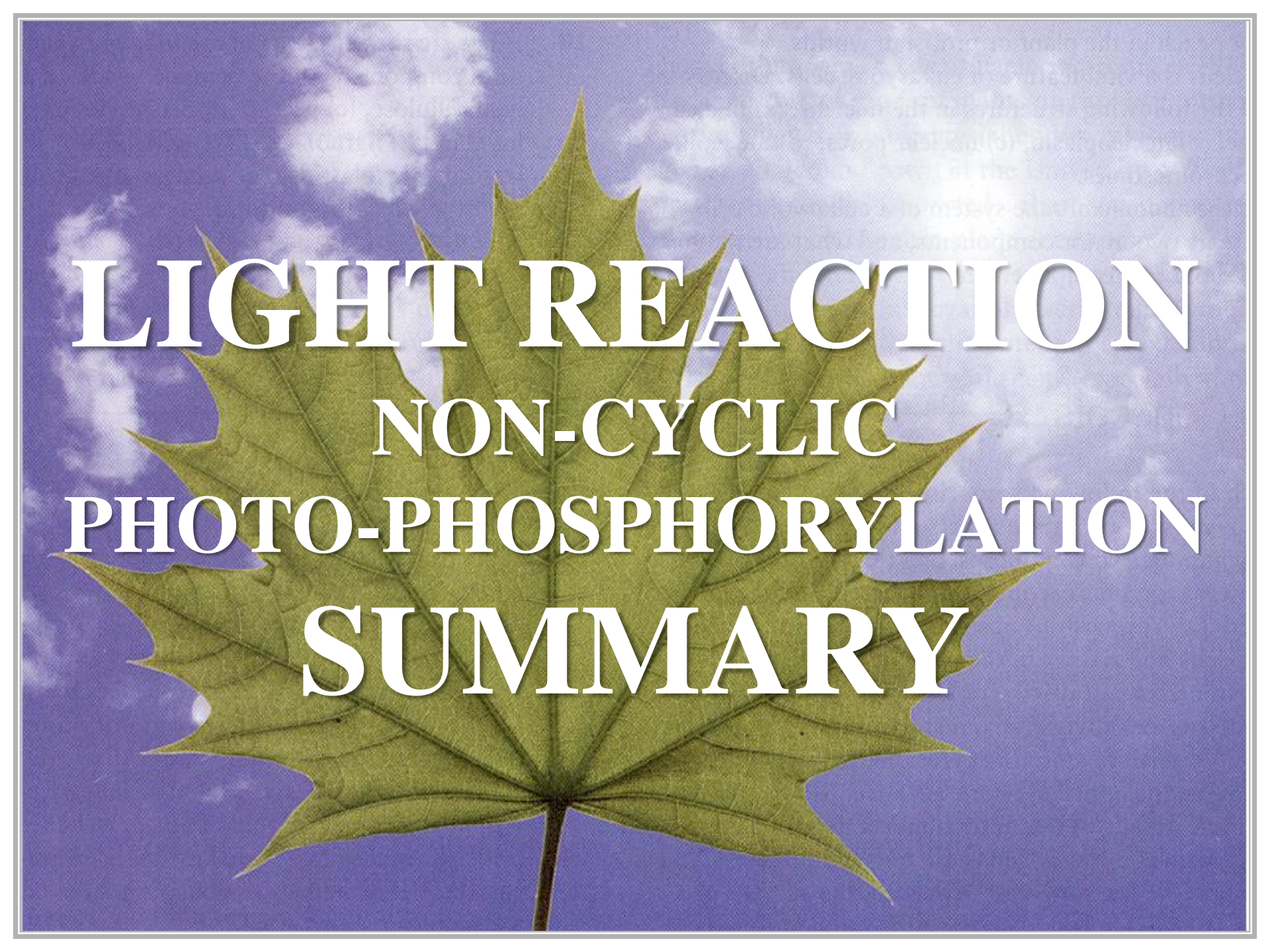
NADPH

**NICOTINAMIDE ADENINE
DINUCLEOTIDE PHOSPHATE**

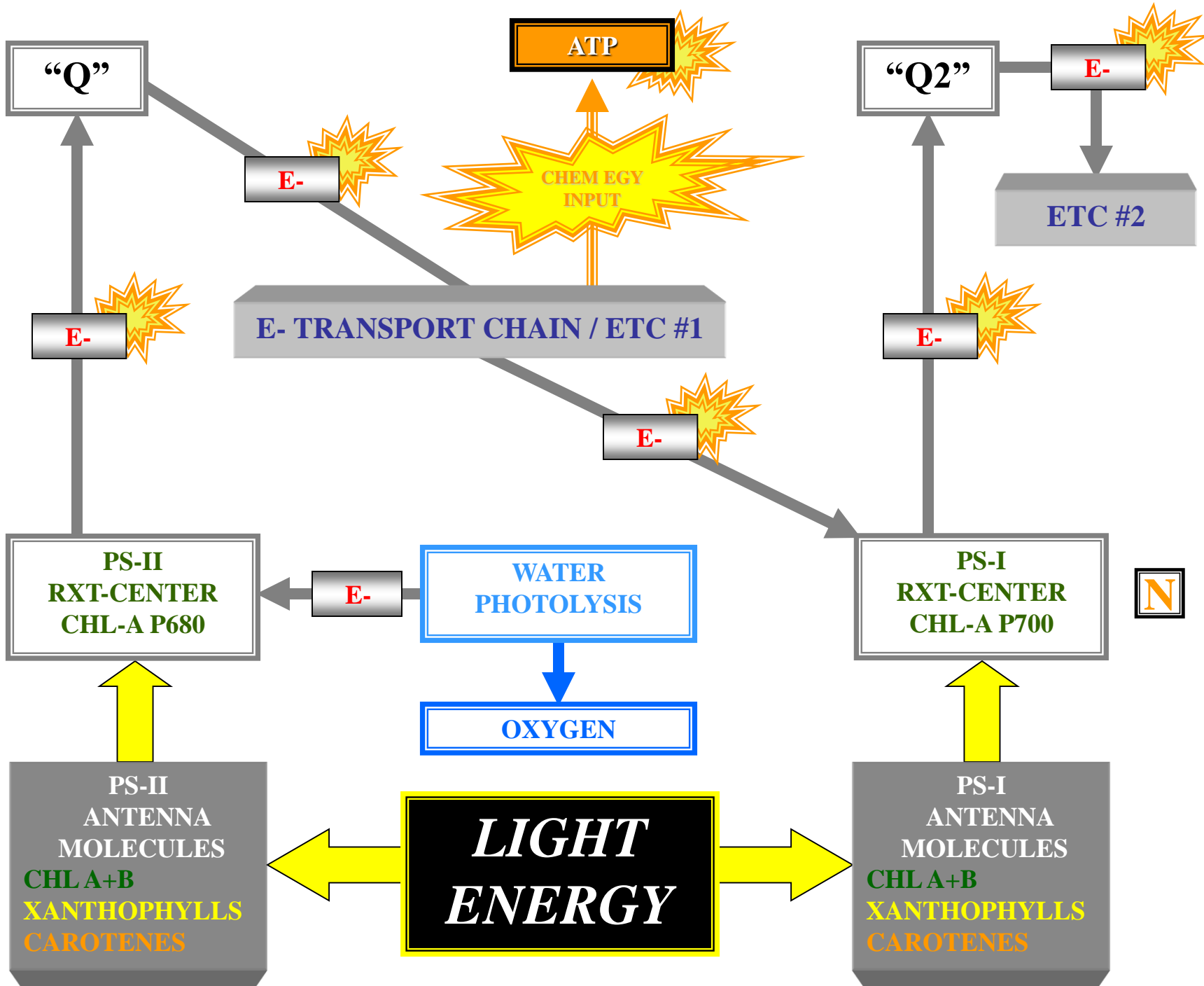
ENERGY MOLECULE

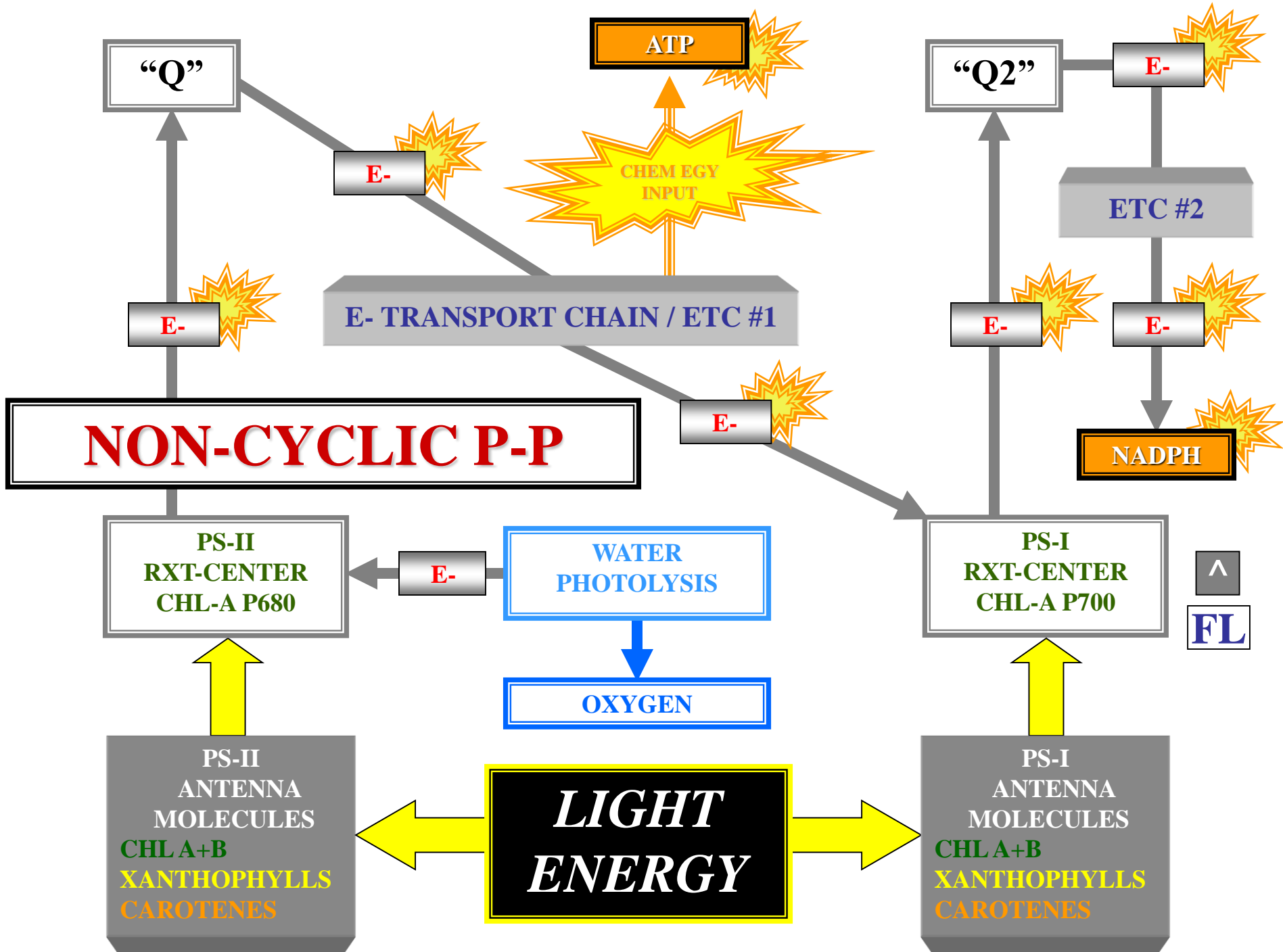
E- DONOR

NADPH

A green maple leaf is centered in the frame, set against a blue sky with scattered white clouds. The leaf's veins are clearly visible, and its stem points downwards. The text is overlaid on the leaf and sky.

LIGHT REACTION
NON-CYCLIC
PHOTO-PHOSPHORYLATION
SUMMARY





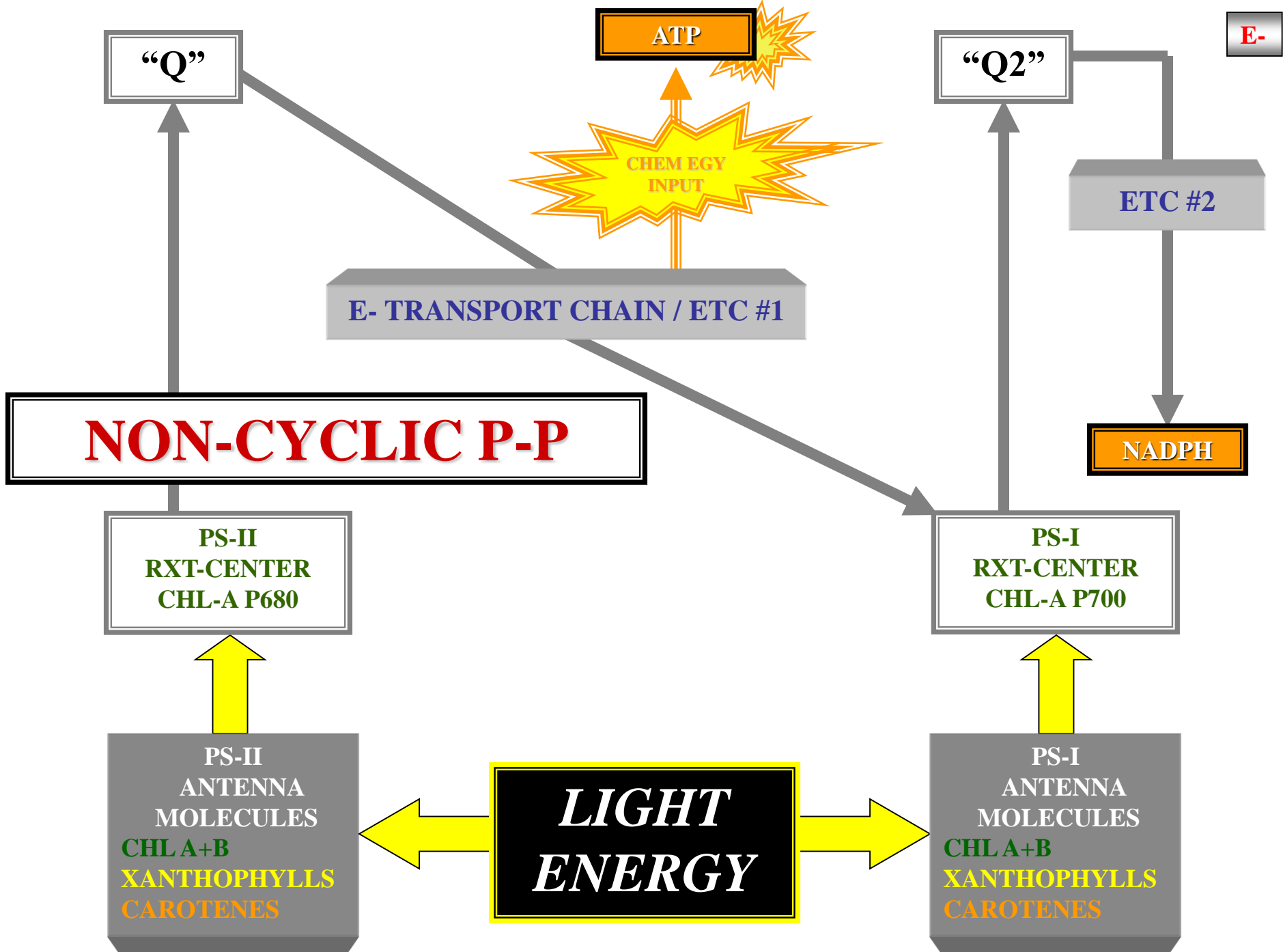


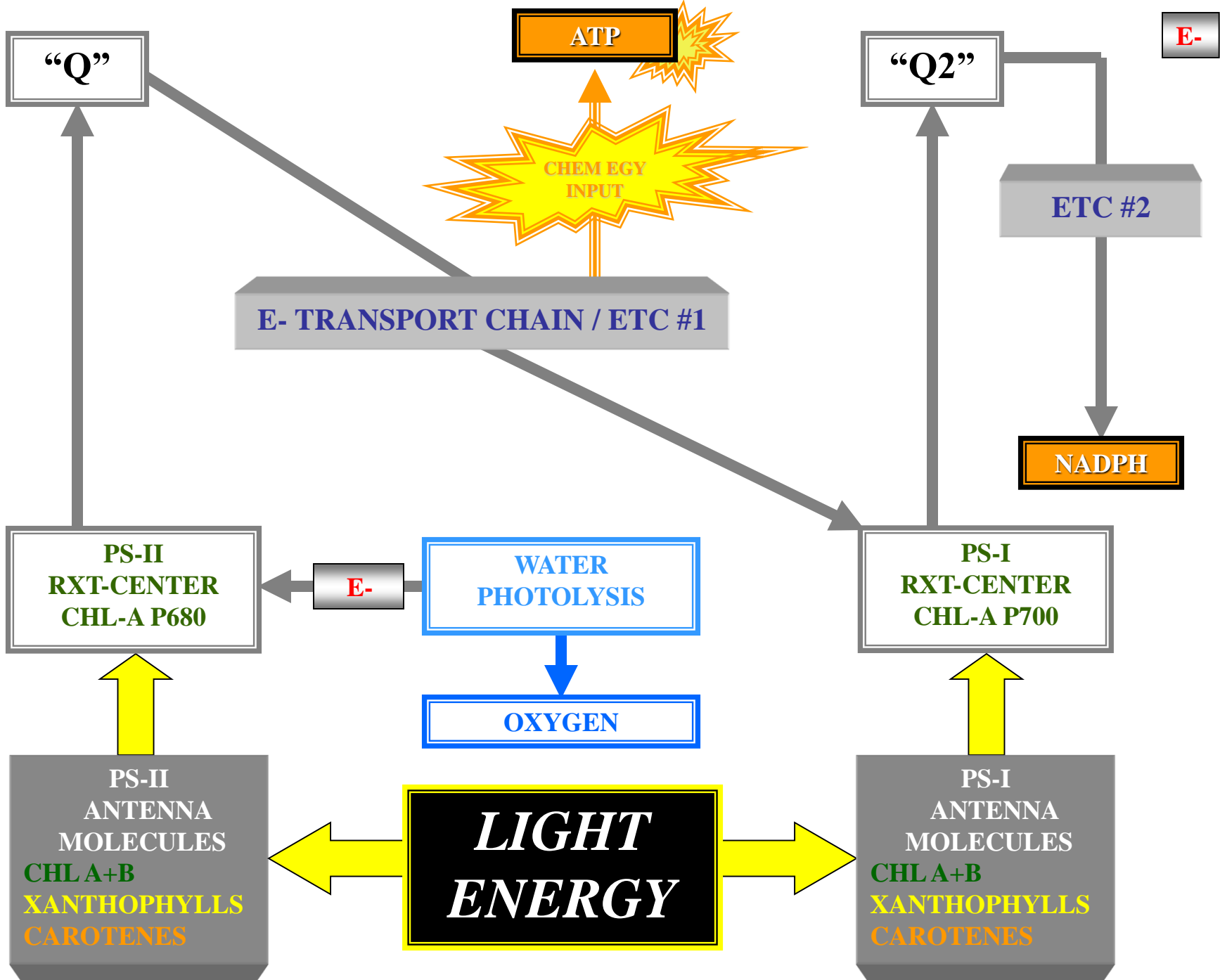
LIGHT REACTION

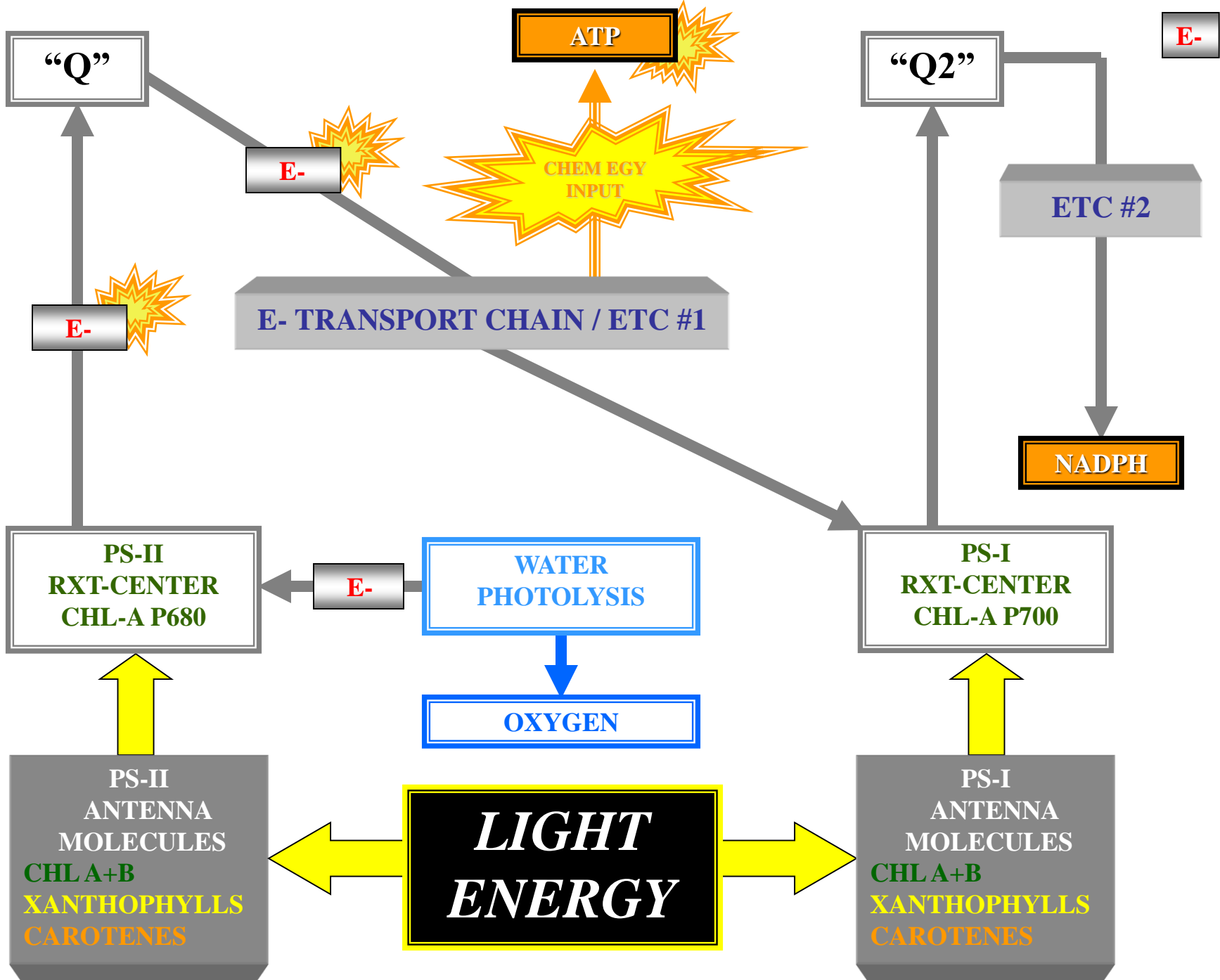
NON-CYCLIC

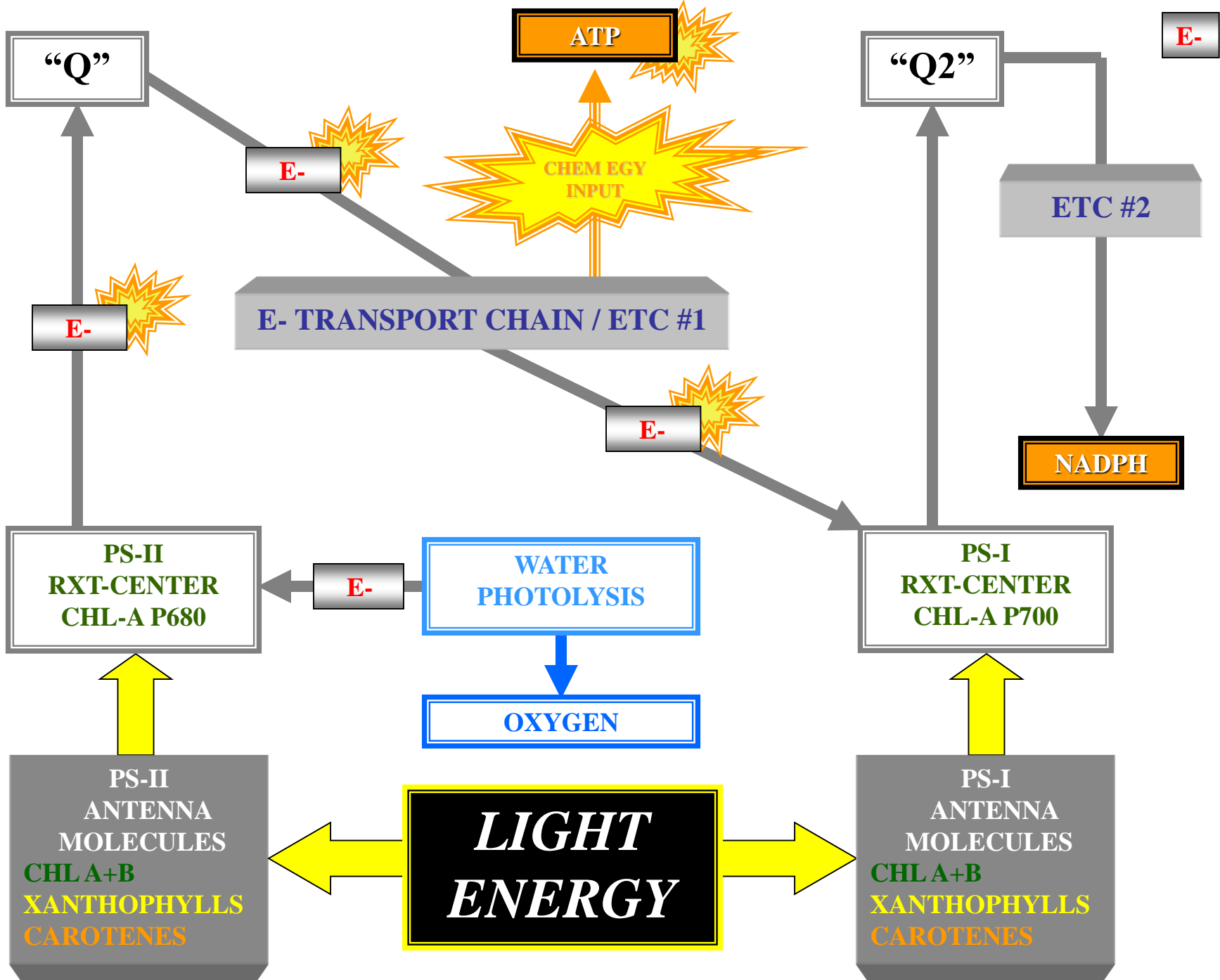
PHOTO-PHOSPHORYLATION

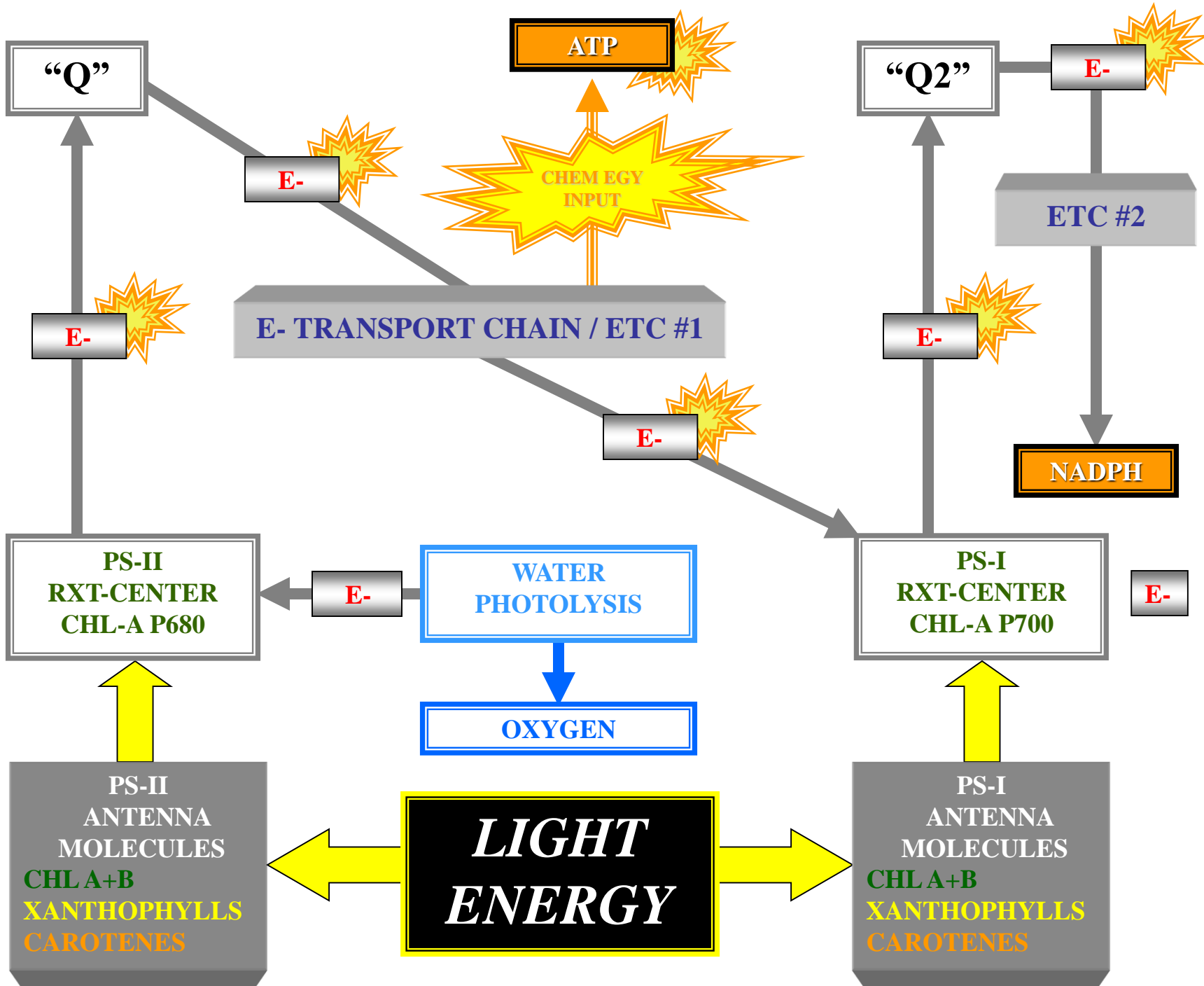
E- FLOW

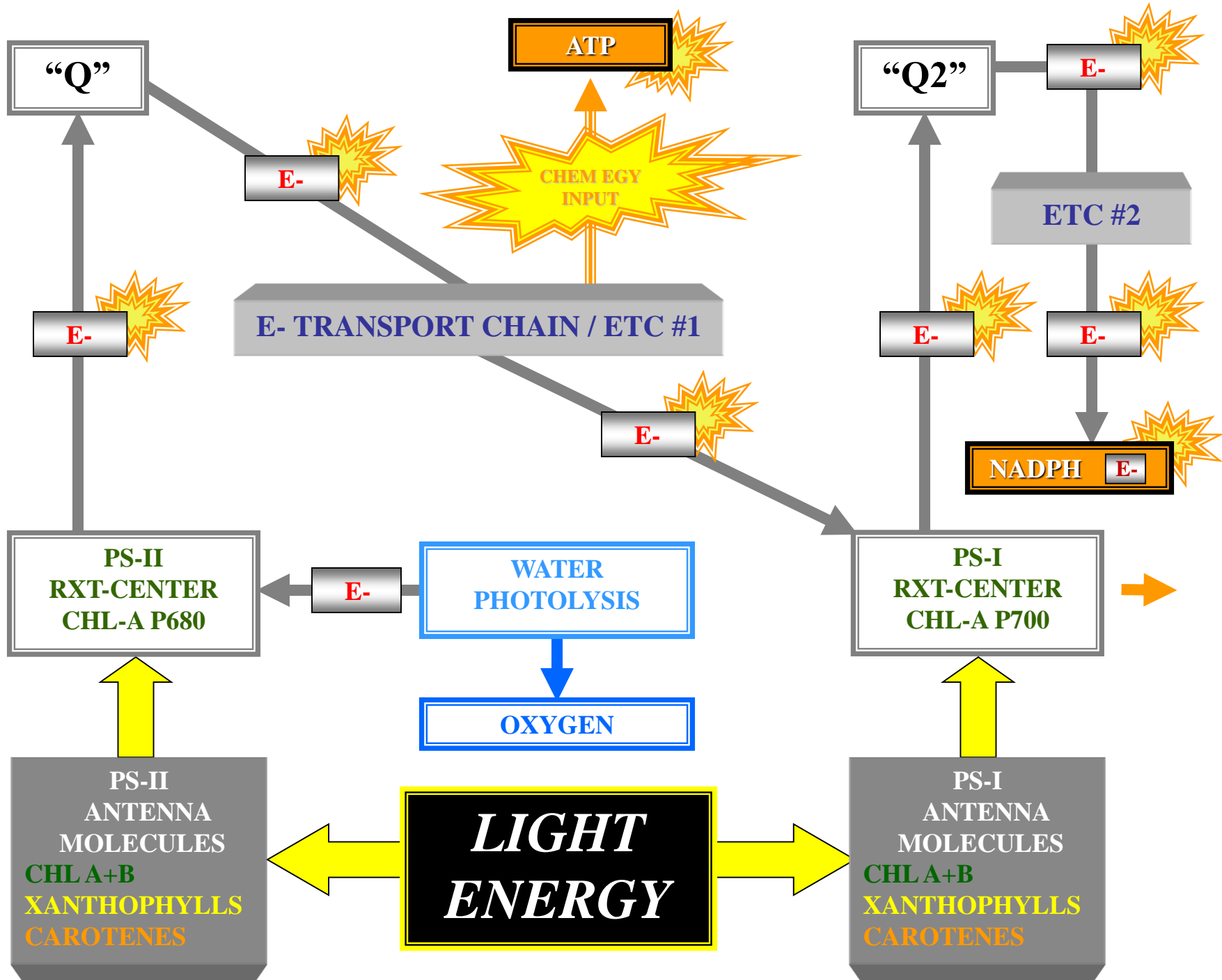












PHOTOSYNTHESIS

DK



WATER

LIGHT ENERGY

E-

PHOTOLYSIS

LT RXT

THYLAKOID
GRANUM

NADPH

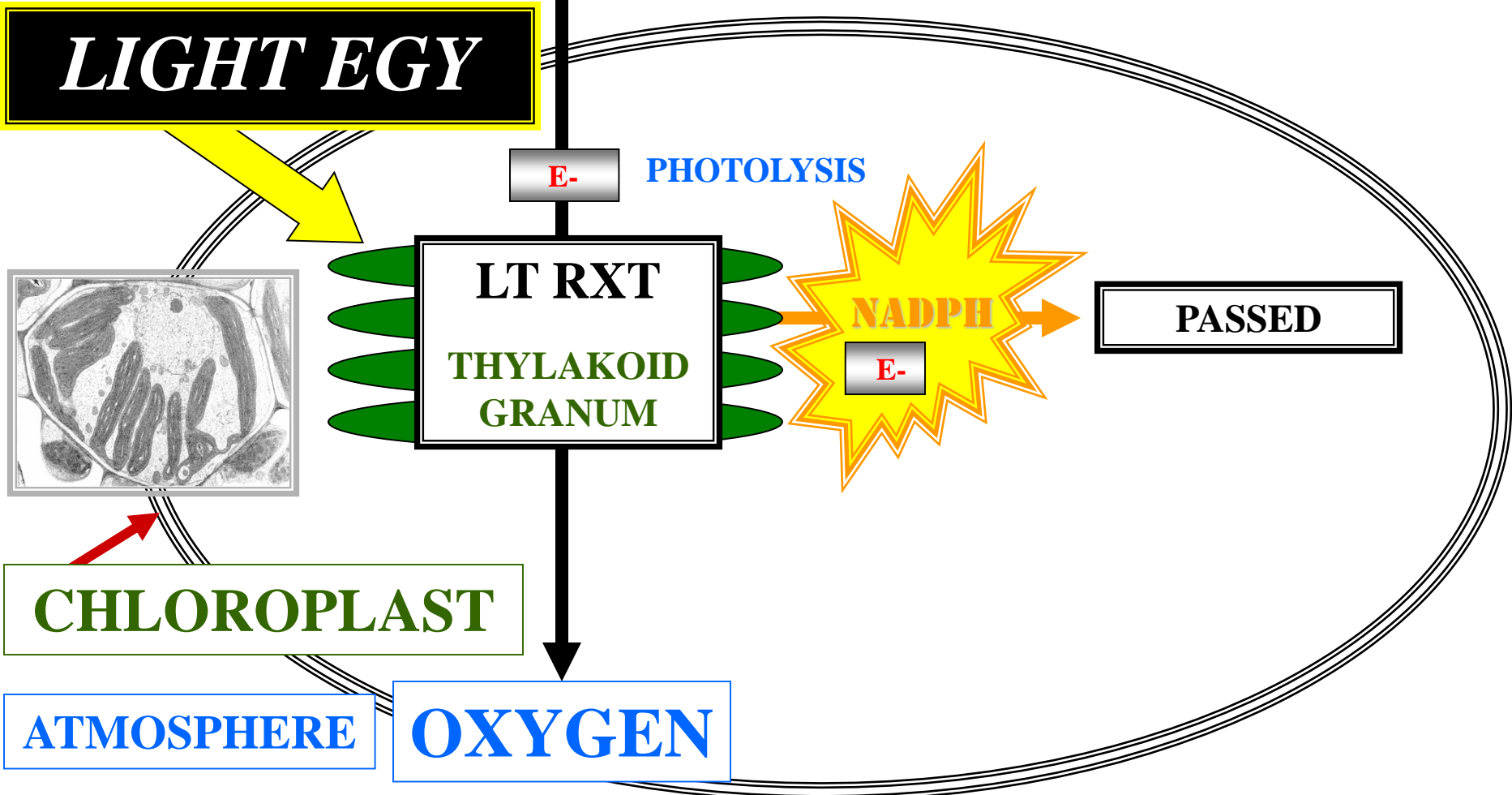
PASSED

E-

CHLOROPLAST

ATMOSPHERE

OXYGEN



PHOTOSYNTHESIS



WATER

LIGHT ENERGY



E-

PHOTOLYSIS

LT RXT

THYLAKOID
GRANUM

NADPH

E-

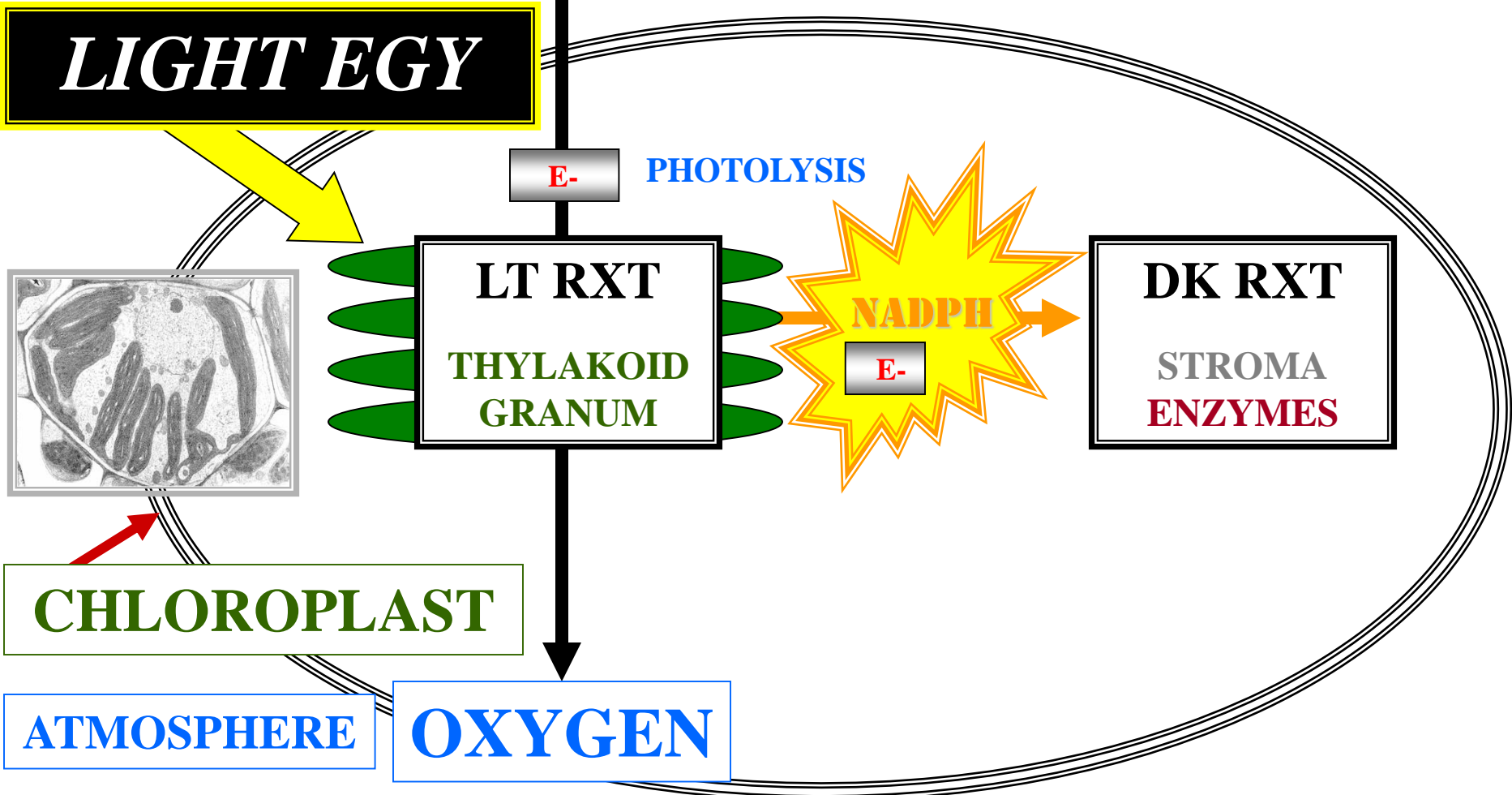
DK RXT

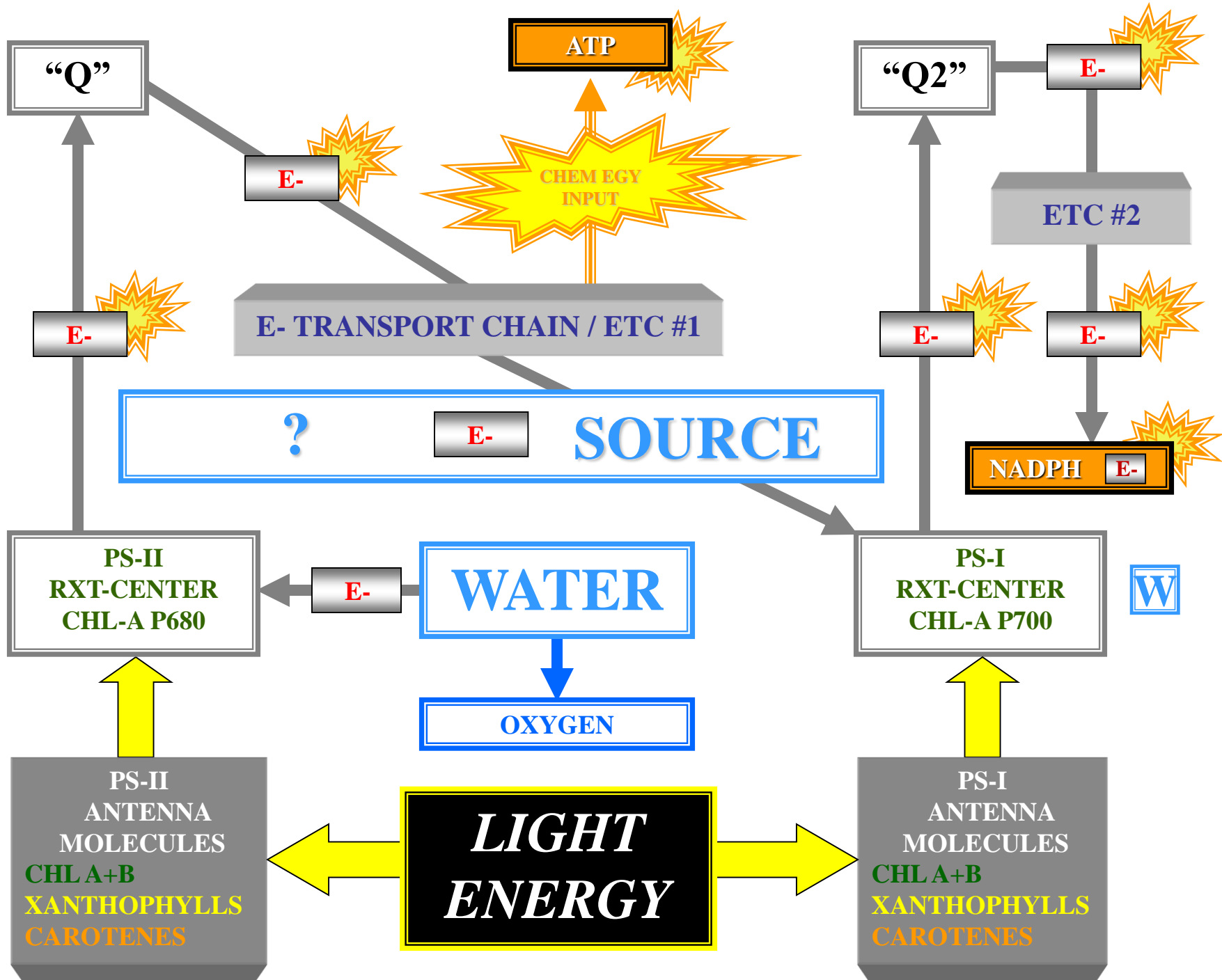
STROMA
ENZYMES

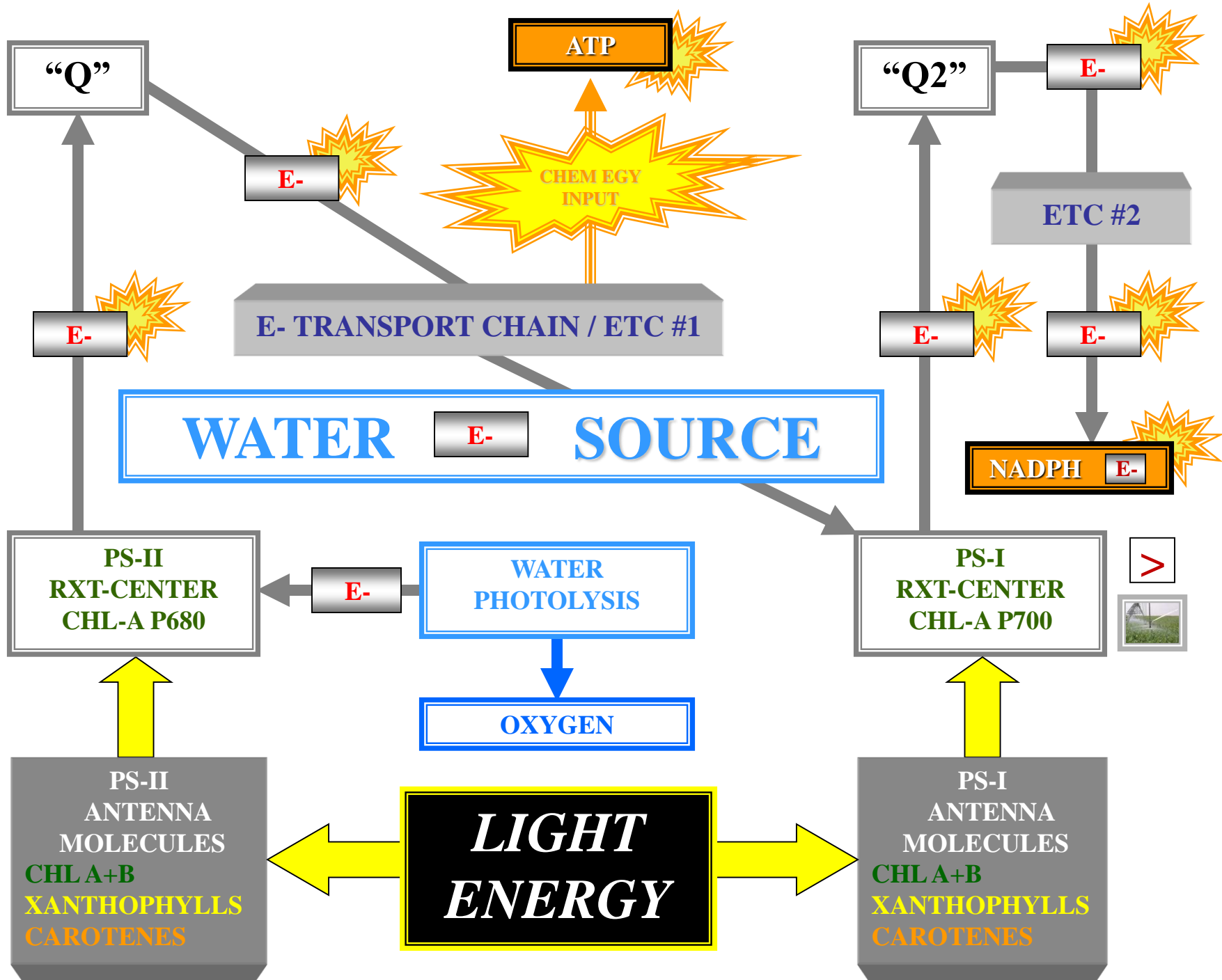
CHLOROPLAST

ATMOSPHERE

OXYGEN







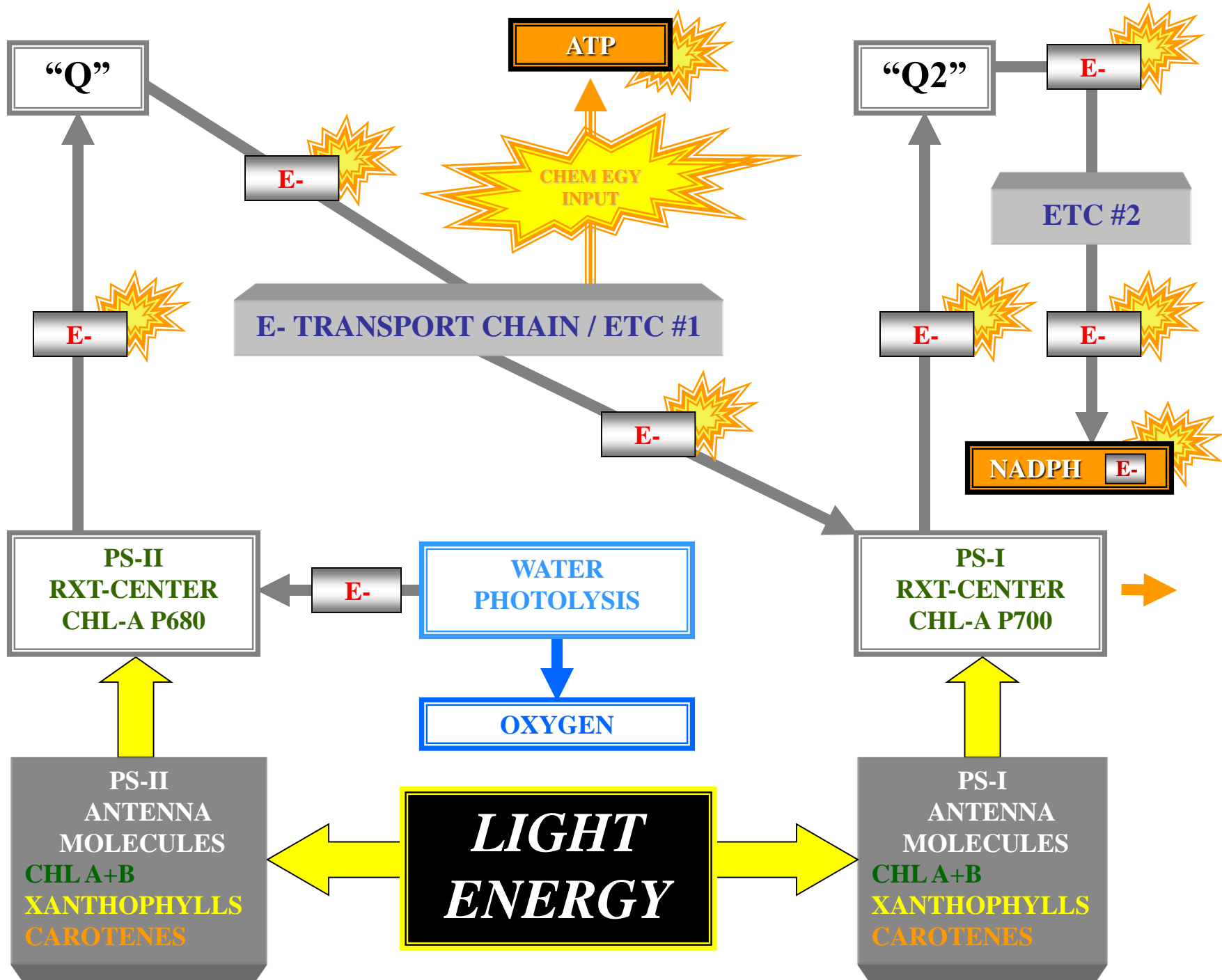


NON-CYCLIC P-P

WATER

E-

SOURCE



PHOTOSYNTHESIS

DK



WATER

LIGHT ENERGY

E-

PHOTOLYSIS

LT RXT

THYLAKOID
GRANUM

NADPH

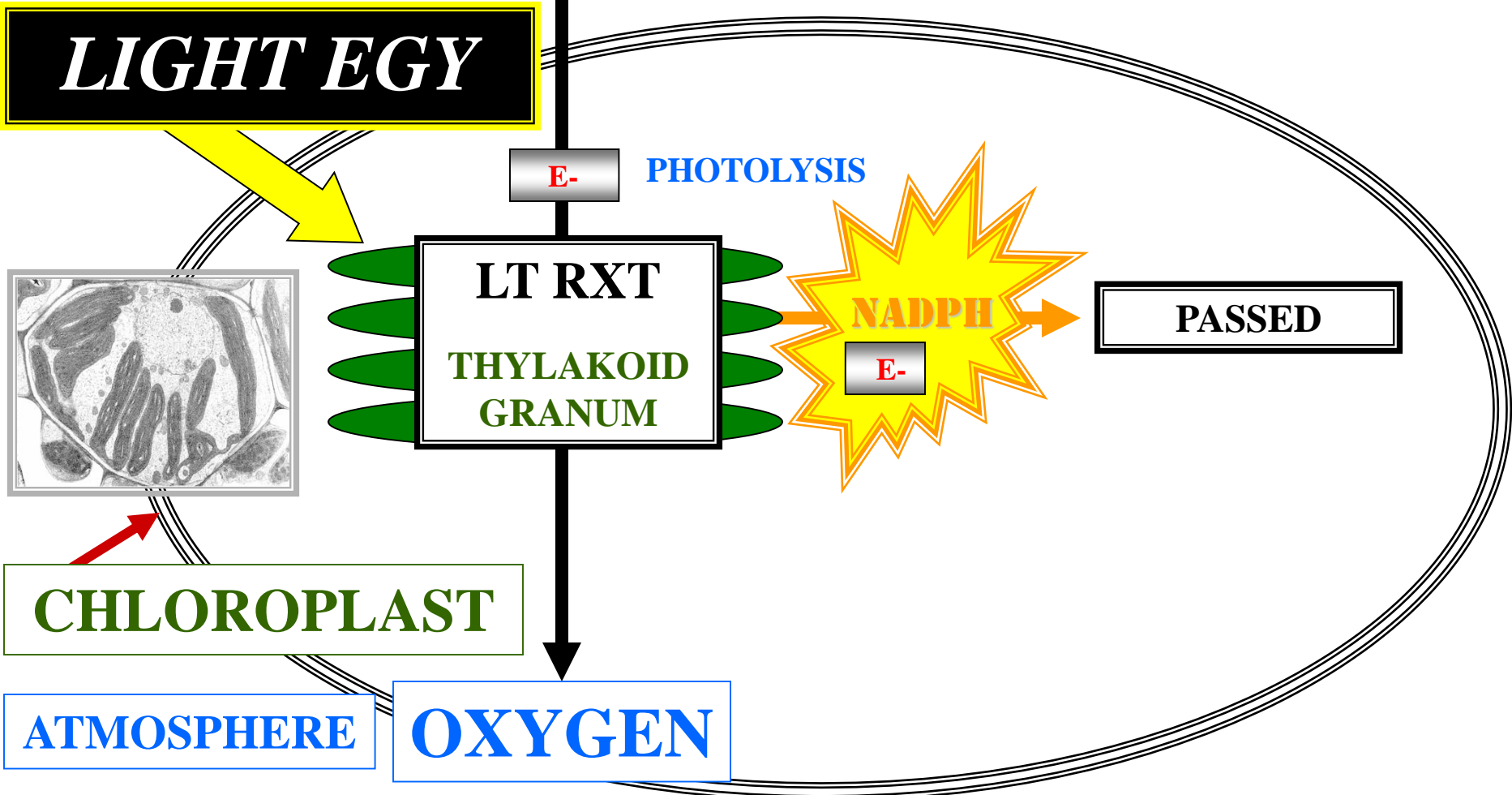
PASSED

E-

CHLOROPLAST

ATMOSPHERE

OXYGEN



PHOTOSYNTHESIS



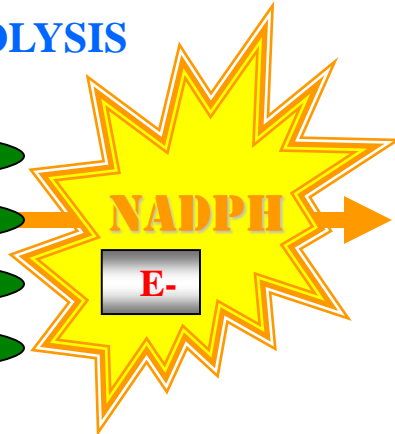
WATER

LIGHT ENERGY



E- PHOTOLYSIS

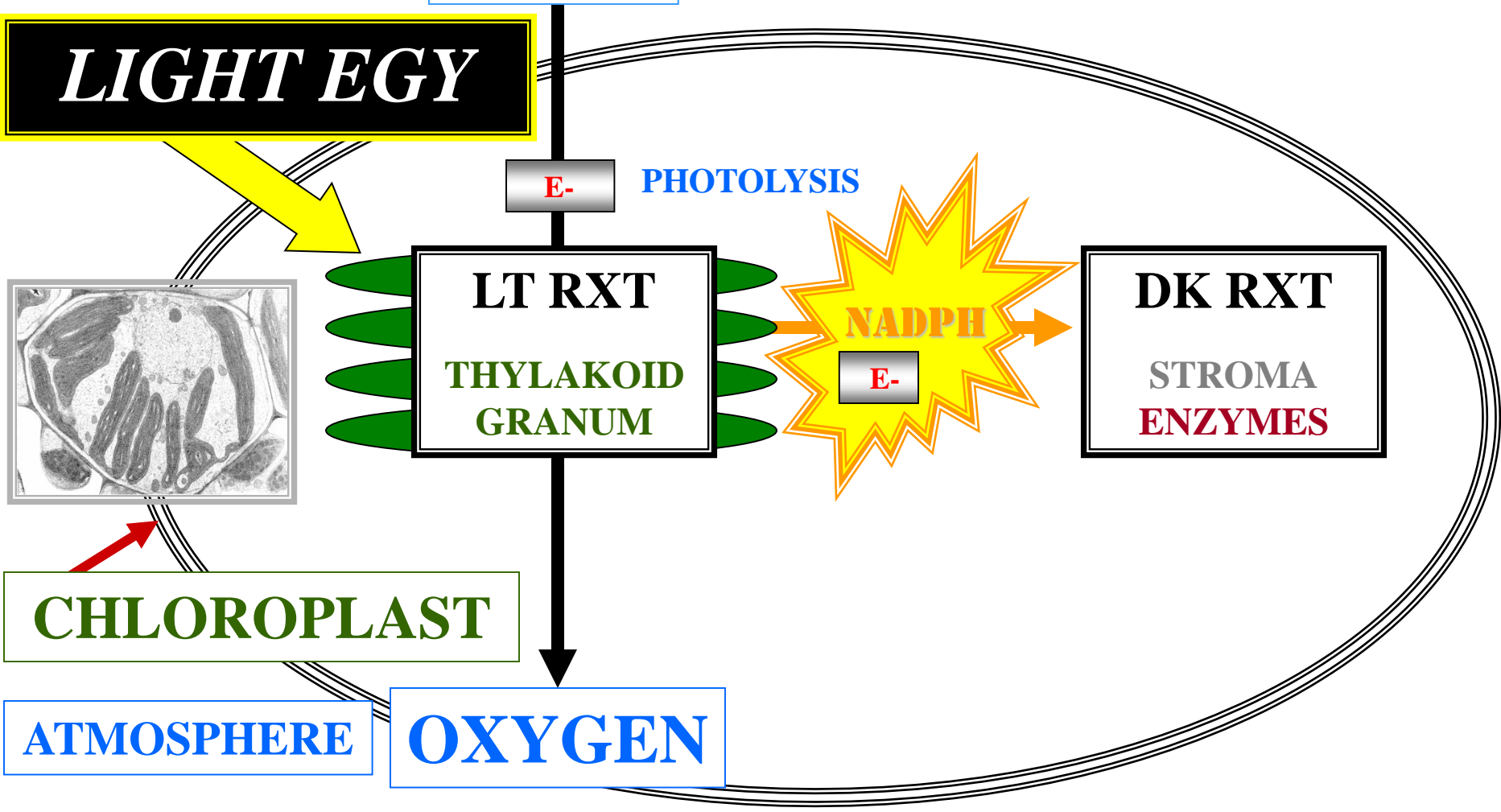
LT RXT
THYLAKOID
GRANUM

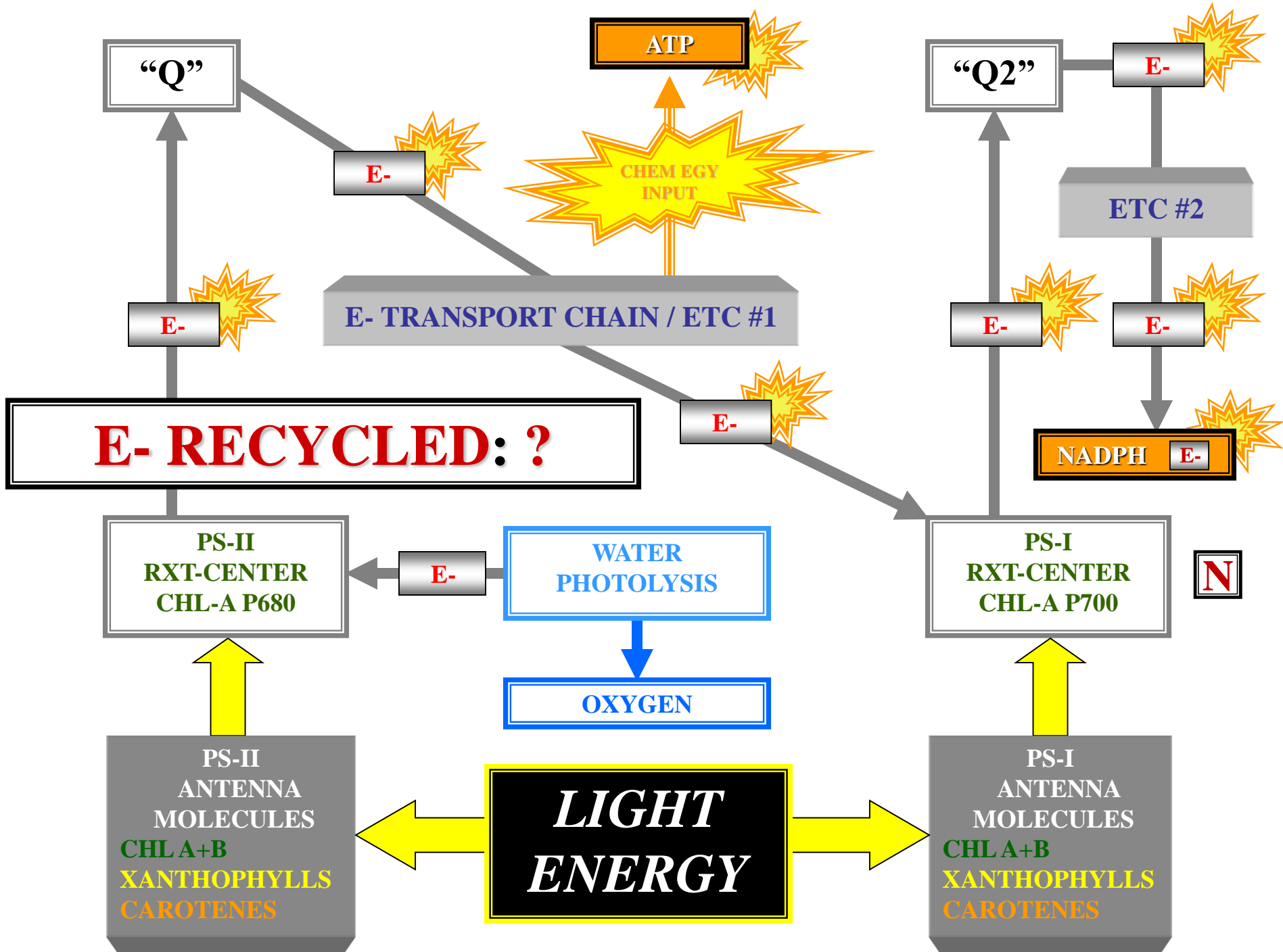


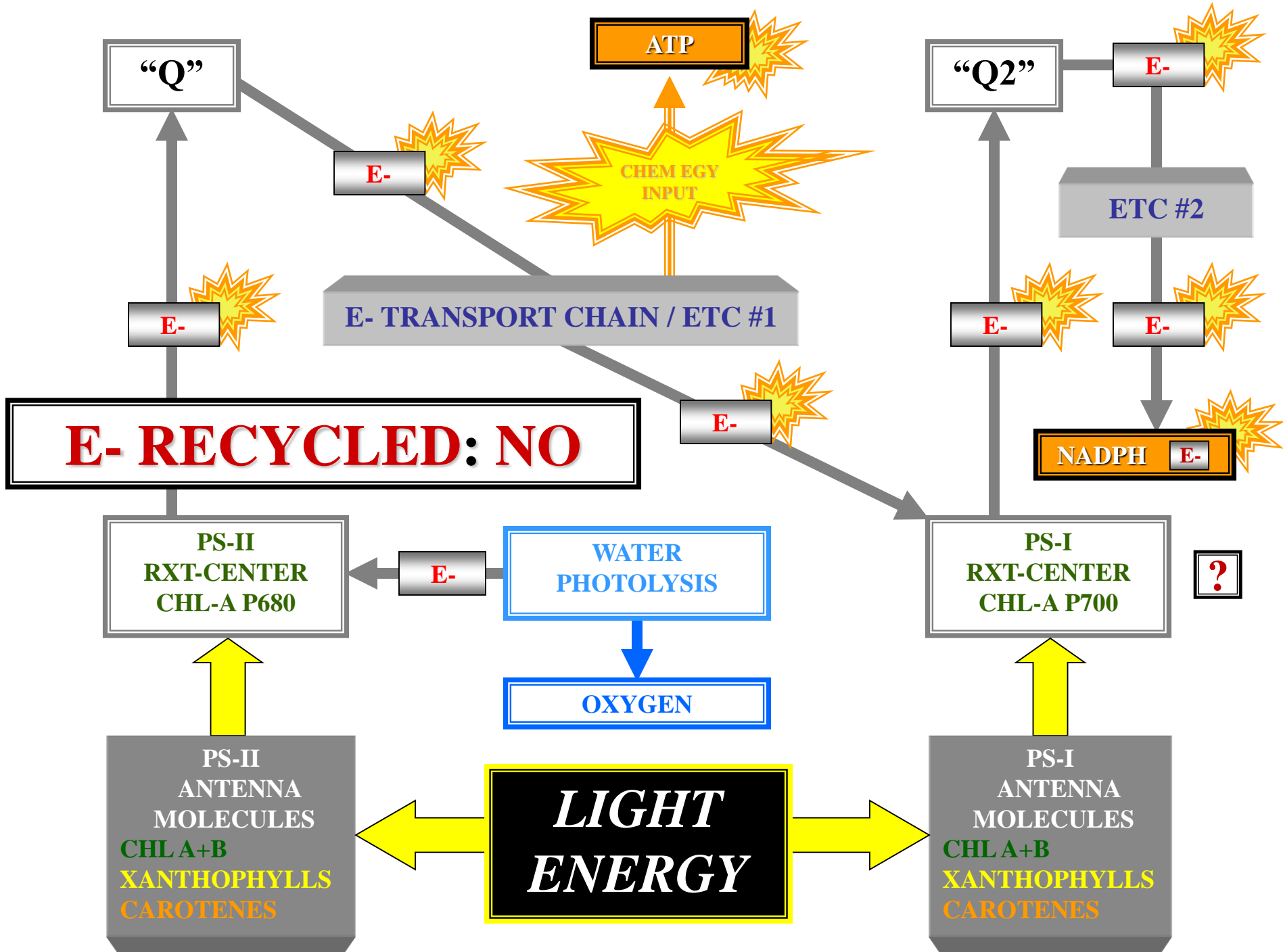
DK RXT
STROMA
ENZYMES

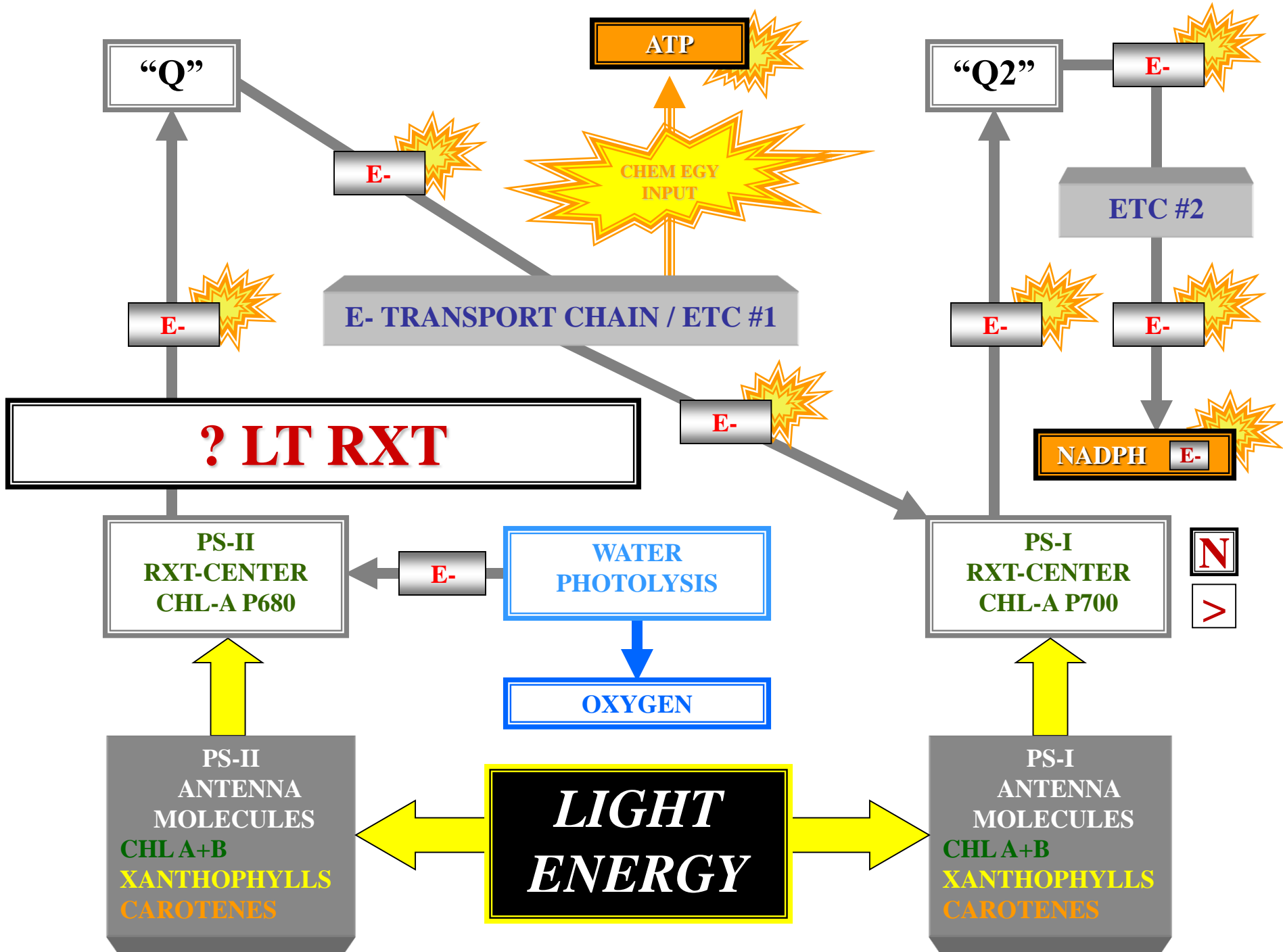
CHLOROPLAST

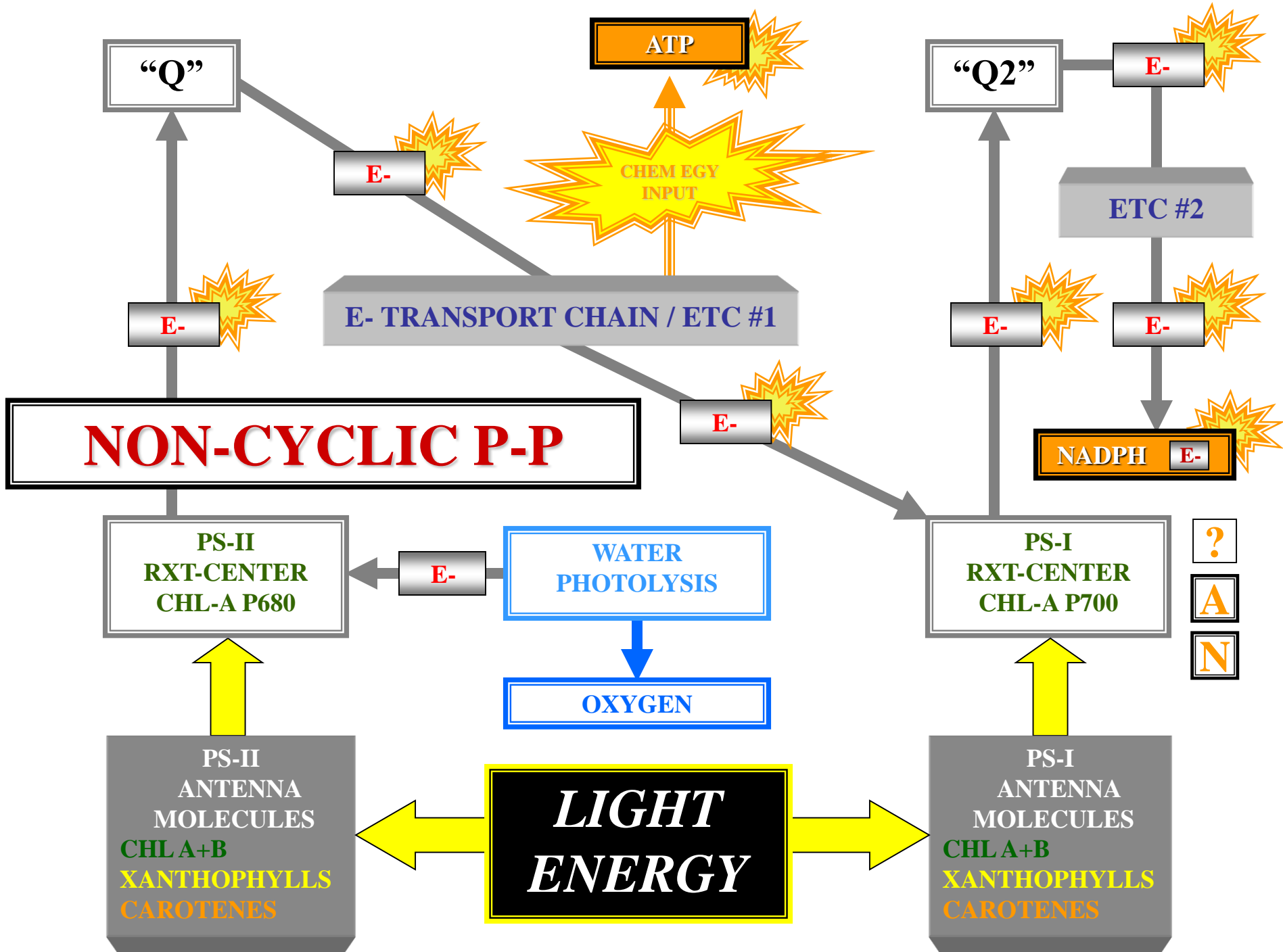
ATMOSPHERE OXYGEN











PHOTOSYNTHESIS

A



WATER

LIGHT ENERGY

E-

PHOTOLYSIS

LT RXT

THYLAKOID
GRANUM

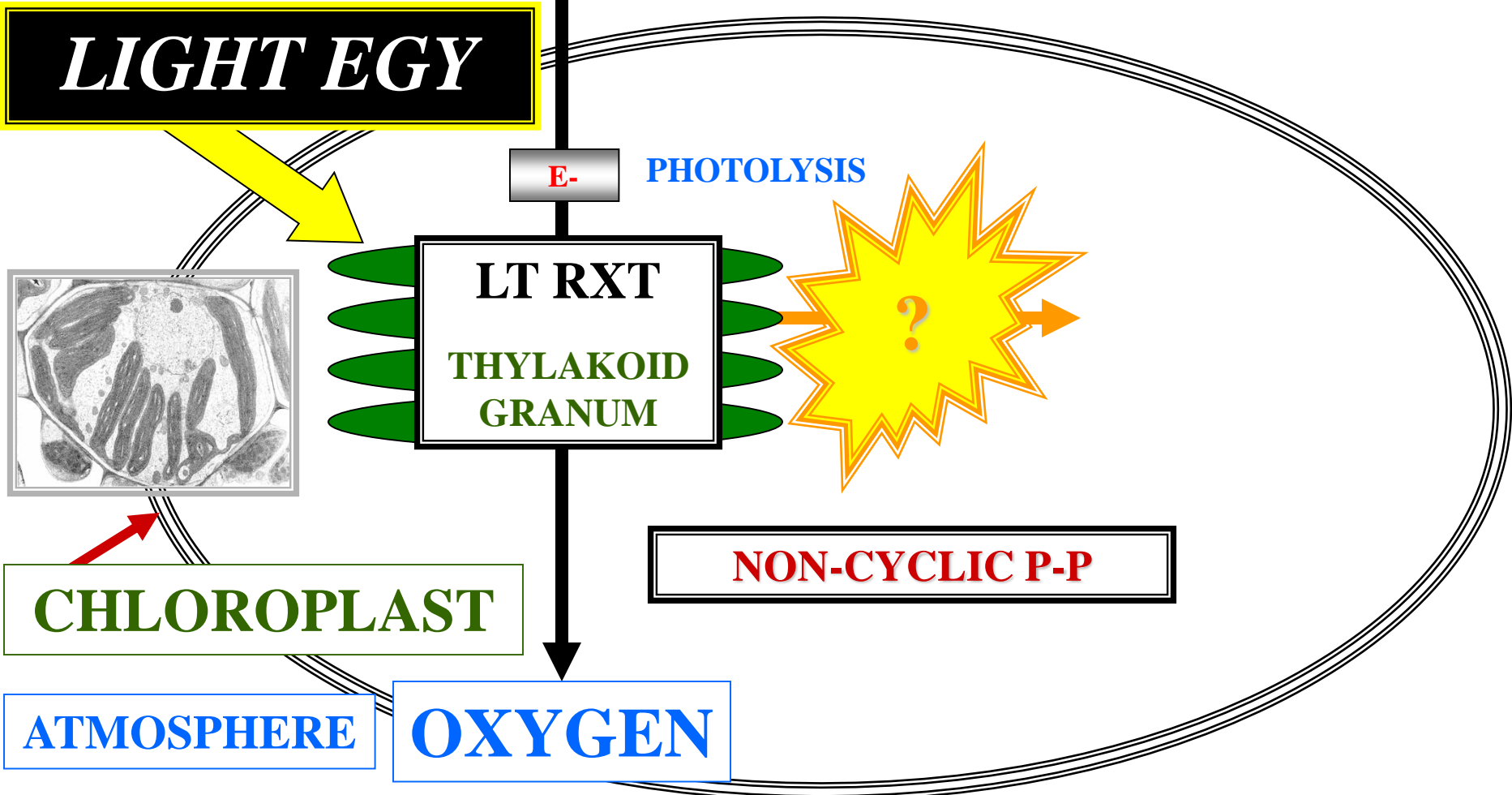
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NON-CYCLIC P-P

CHLOROPLAST

ATMOSPHERE

OXYGEN



PHOTOSYNTHESIS

N



WATER

LIGHT ENERGY



CHLOROPLAST

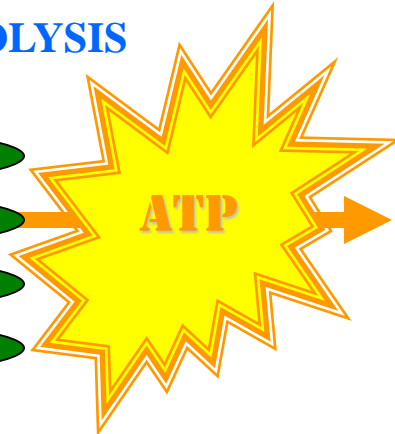
ATMOSPHERE

OXYGEN

E-

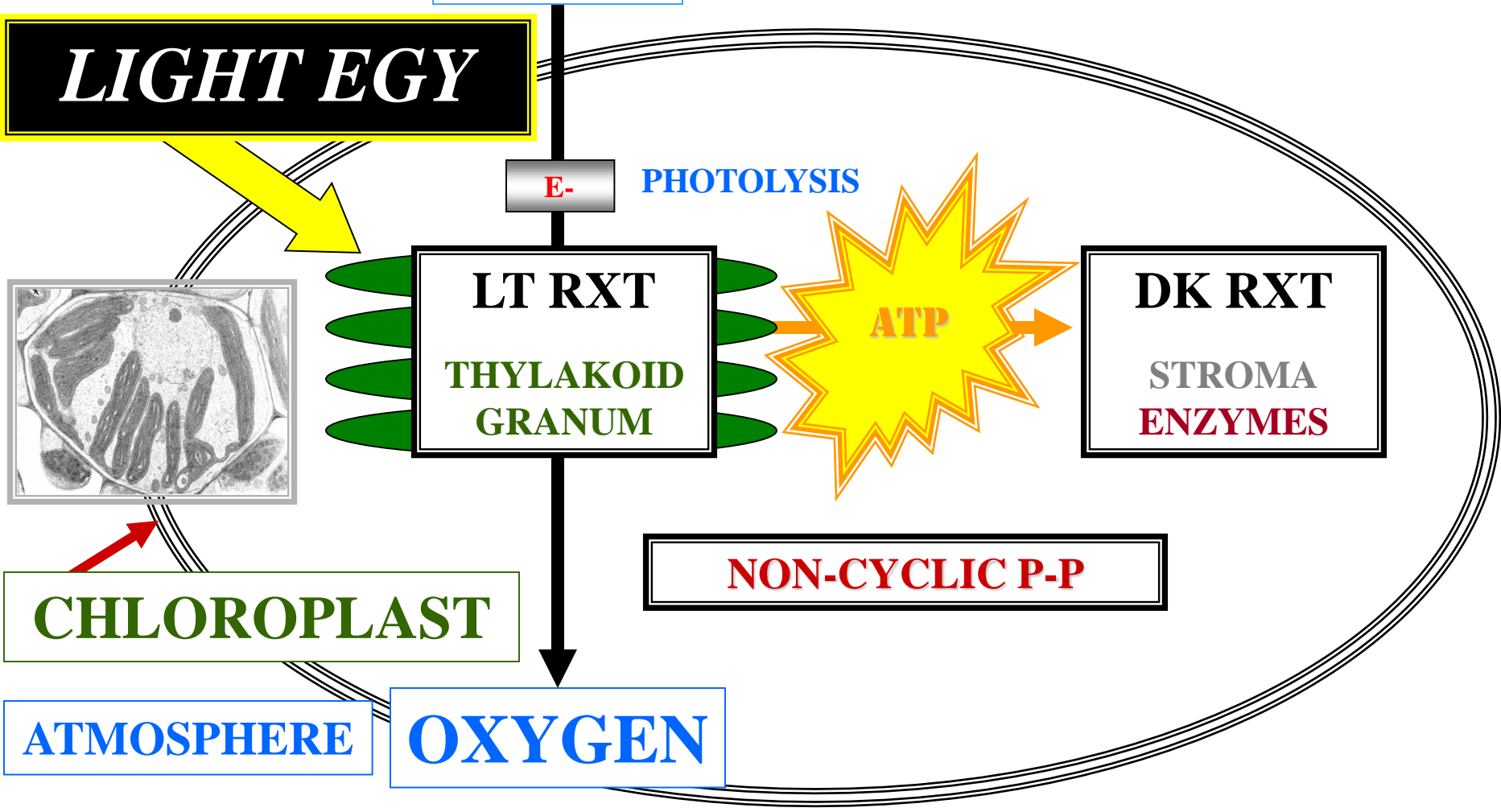
PHOTOLYSIS

LT RXT
THYLAKOID
GRANUM



DK RXT
STROMA
ENZYMES

NON-CYCLIC P-P



PHOTOSYNTHESIS



S

NC



WATER

LIGHT ENERGY

E-

PHOTOLYSIS

LT RXT

THYLAKOID
GRANUM

NADPH

DK RXT

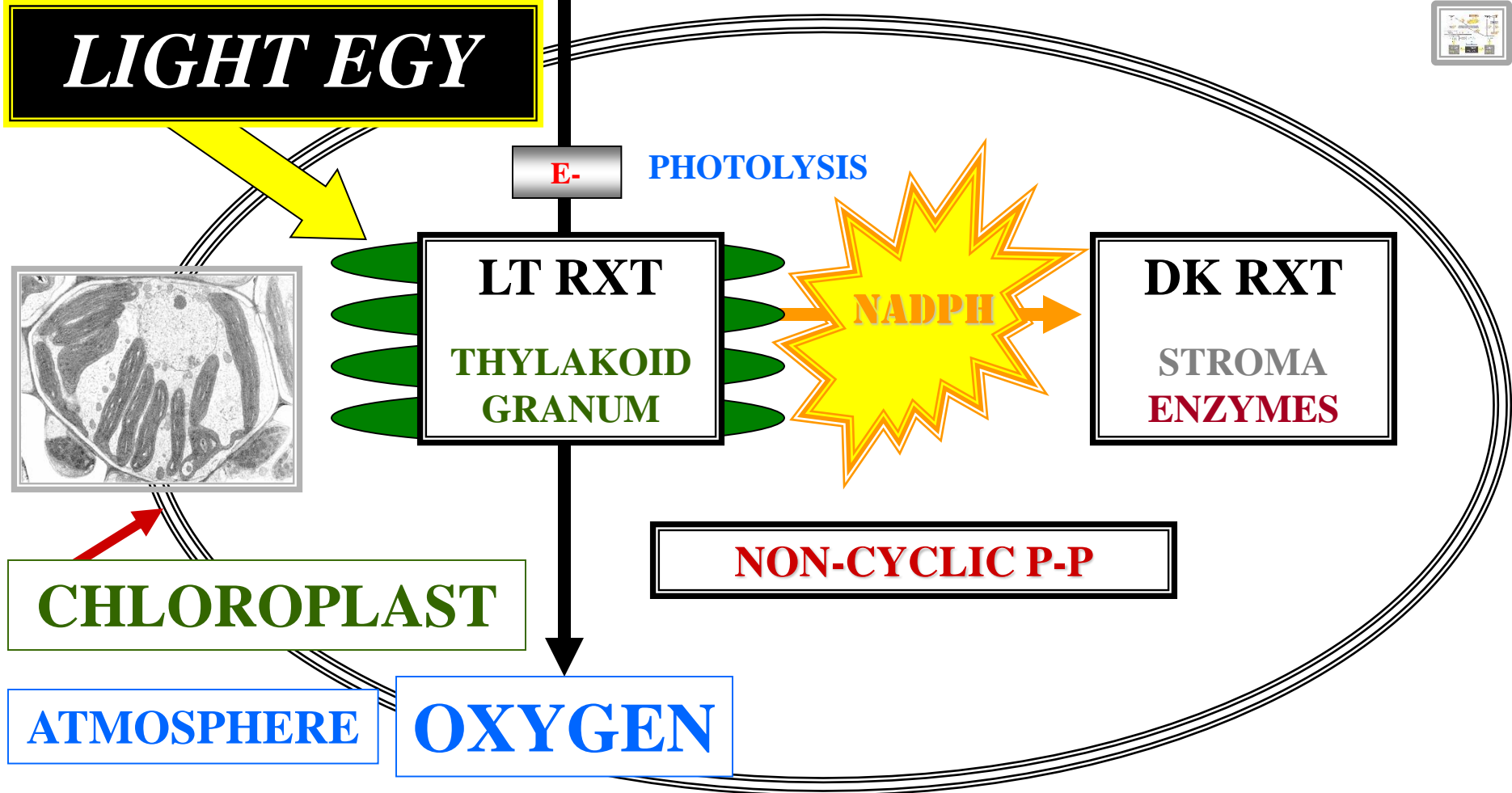
STROMA
ENZYMES

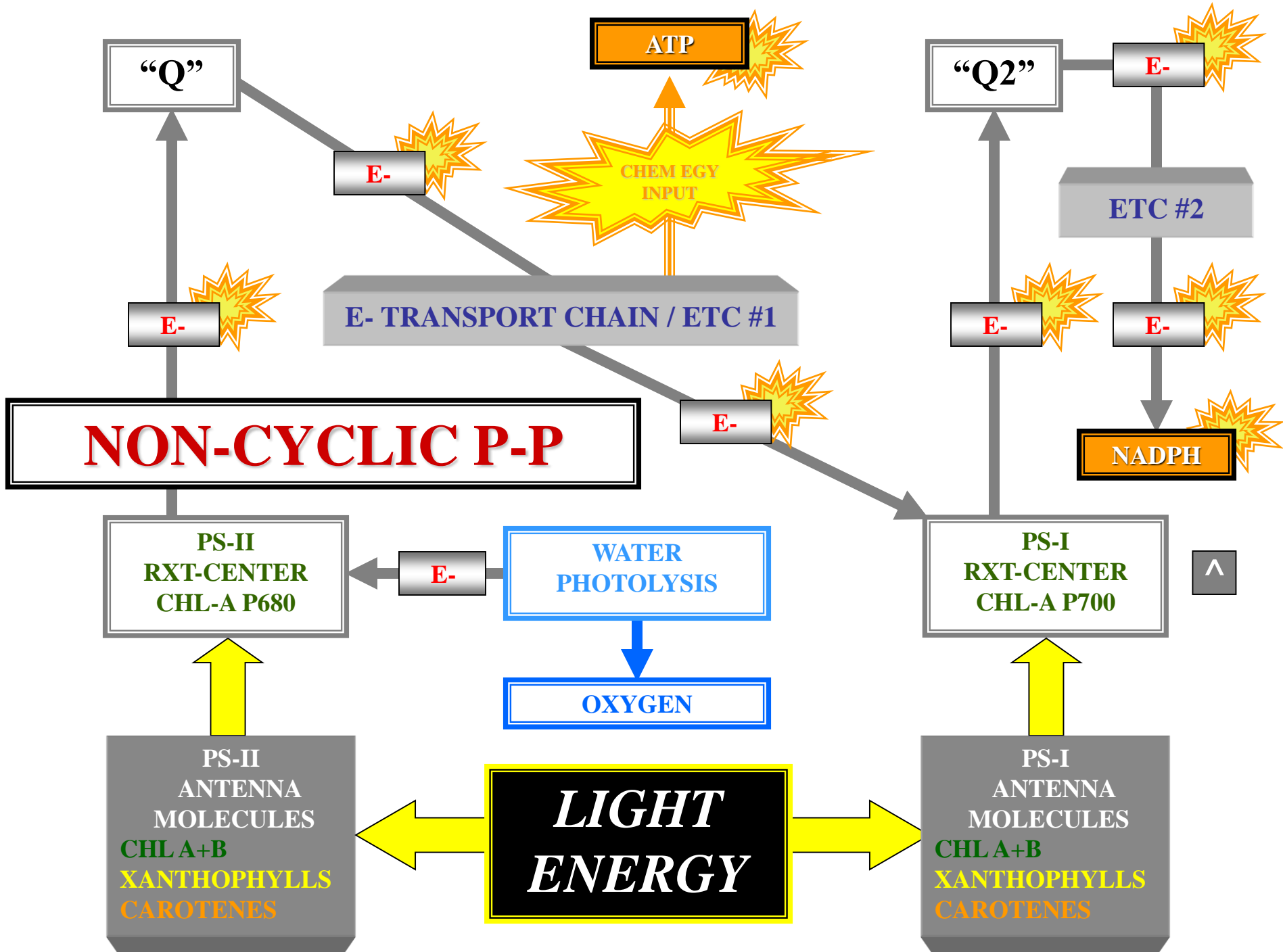
NON-CYCLIC P-P

CHLOROPLAST

ATMOSPHERE

OXYGEN







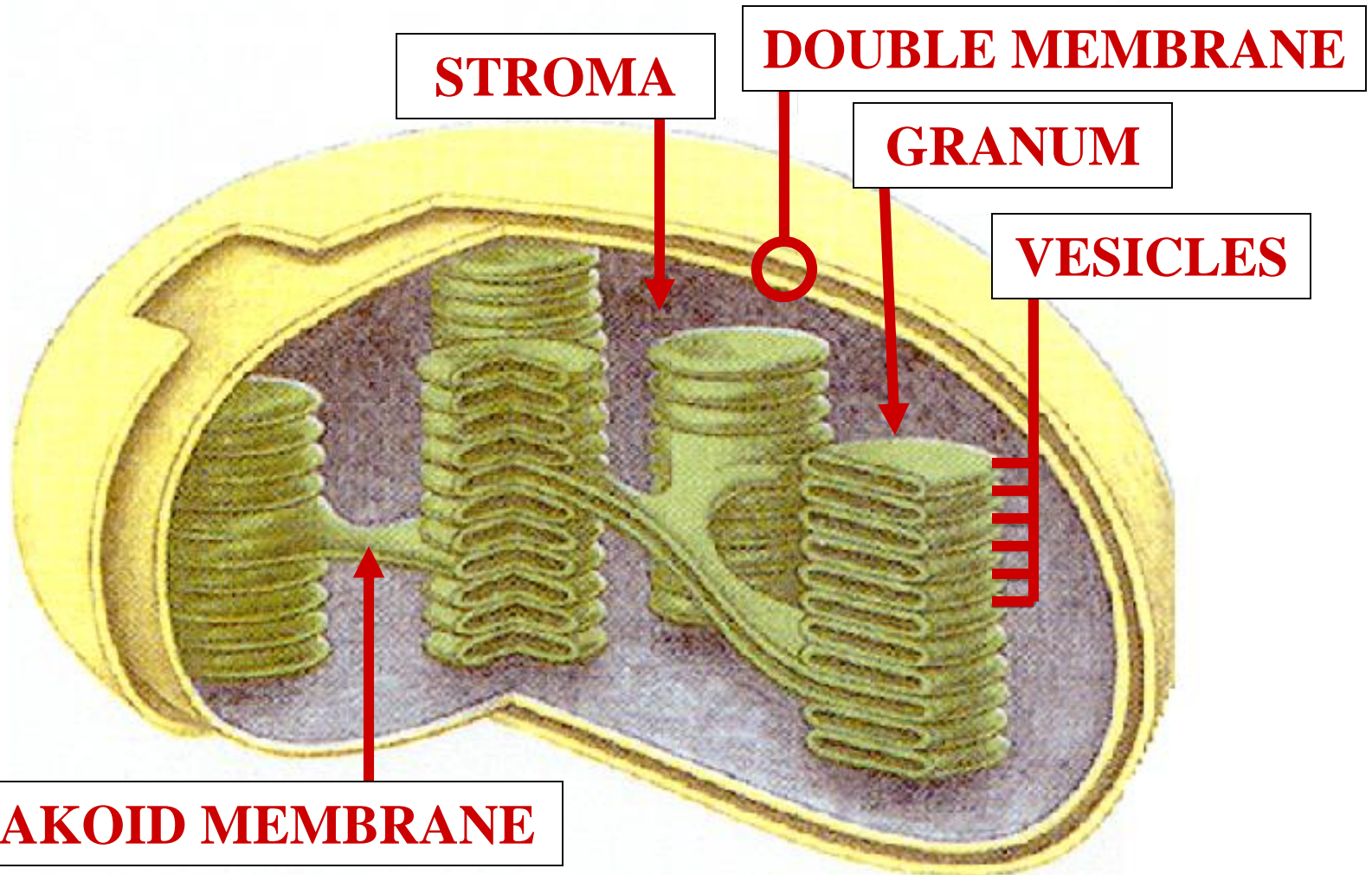
LIGHT REACTION

CYCLIC

PHOTO-PHOSPHORYLATION

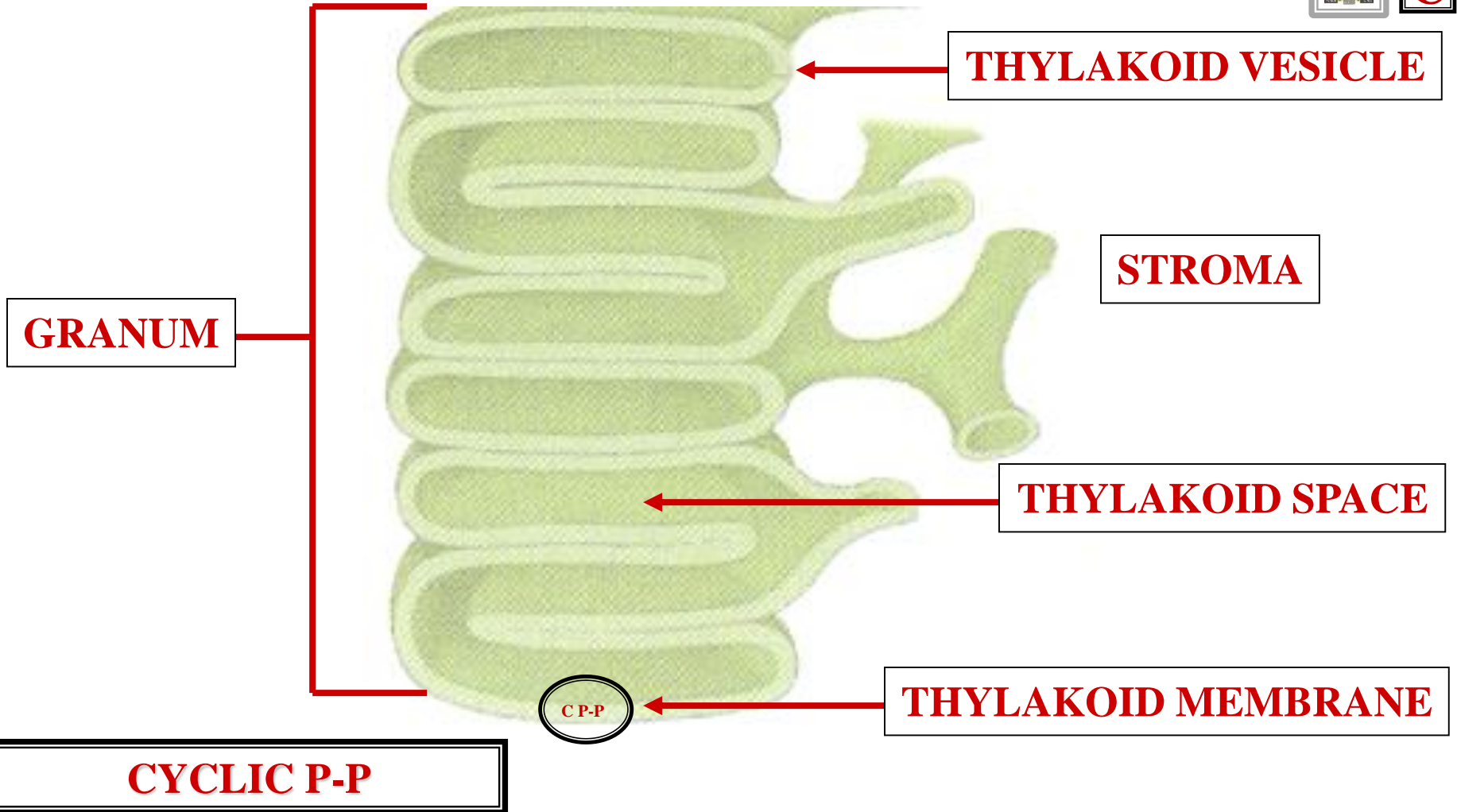
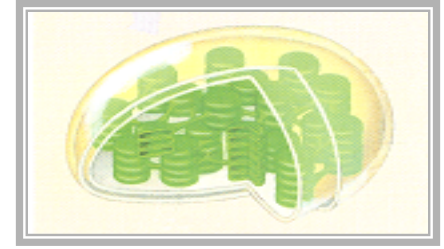


CHLOROPLAST ULTRASTRUCTURE





CHLOROPLAST THYLAKOID



GRANUM

THYLAKOID VESICLE

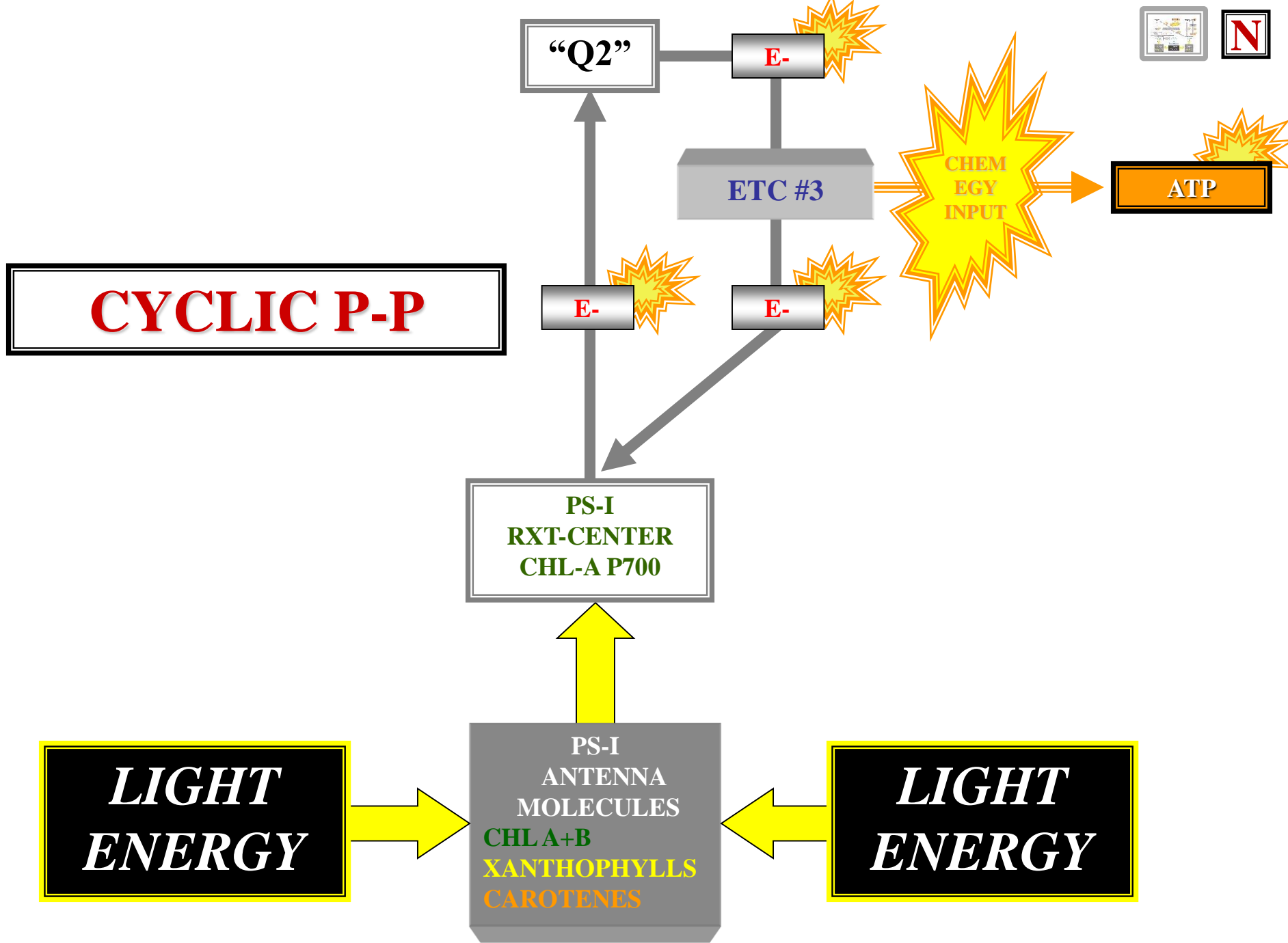
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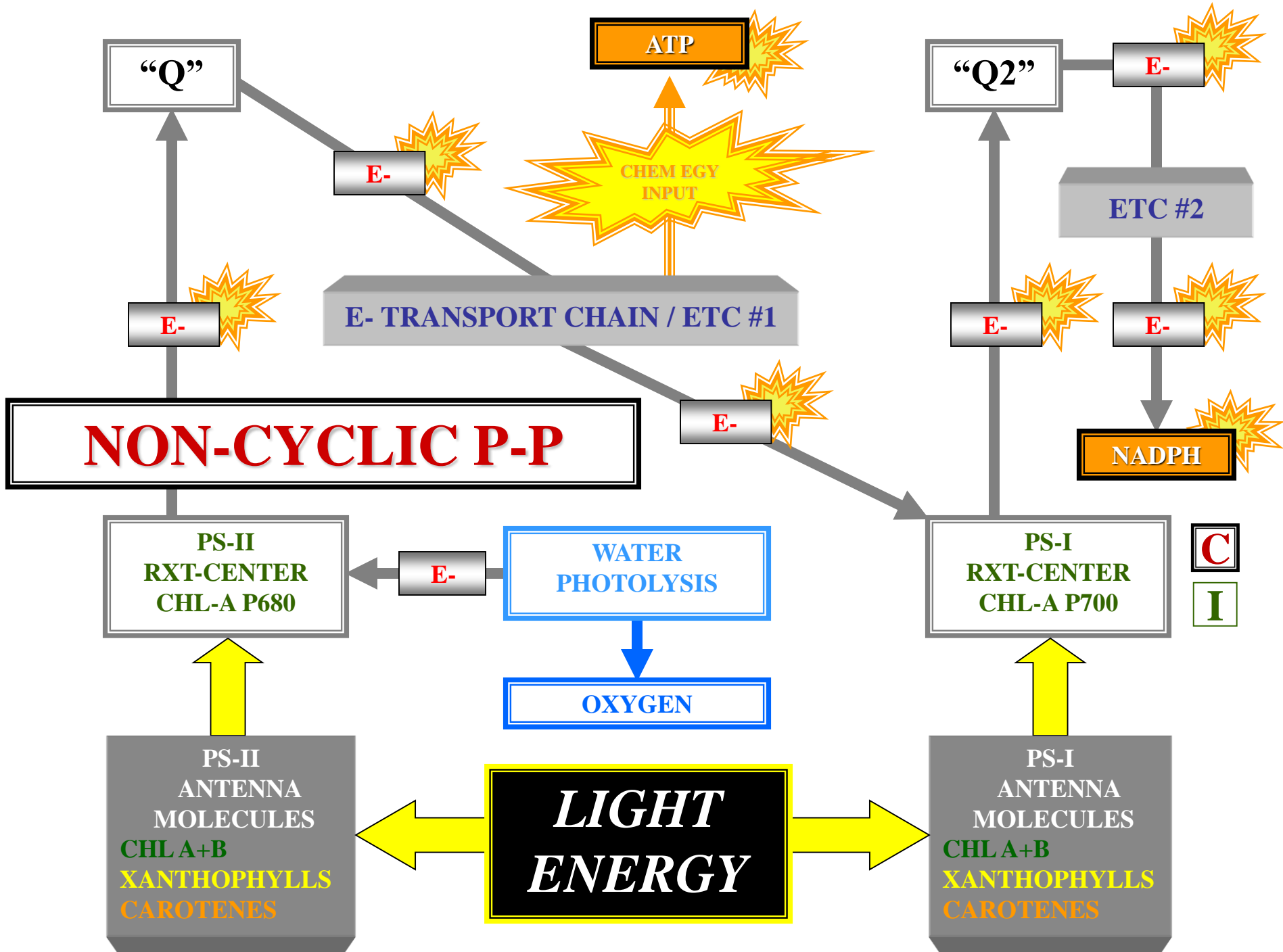
THYLAKOID SPACE

THYLAKOID MEMBRANE

C-P-P

CYCLIC P-P





CYCLIC P-P

“Q2”

E-

ETC #3

E-

E-

CHEM
EGY
INPUT

ATP

^

PS-I
RXT-CENTER
CHL-A P700

LIGHT
ENERGY

PS-I
ANTENNA
MOLECULES
CHL A+B
XANTHOPHYLLS
CAROTENES

LIGHT
ENERGY

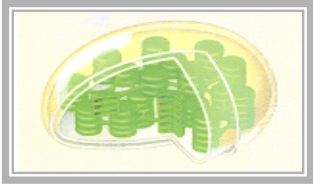


PHOTOSYSTEM I

CHLOROPLAST

PS-I

THYLAKOID



GRANUM

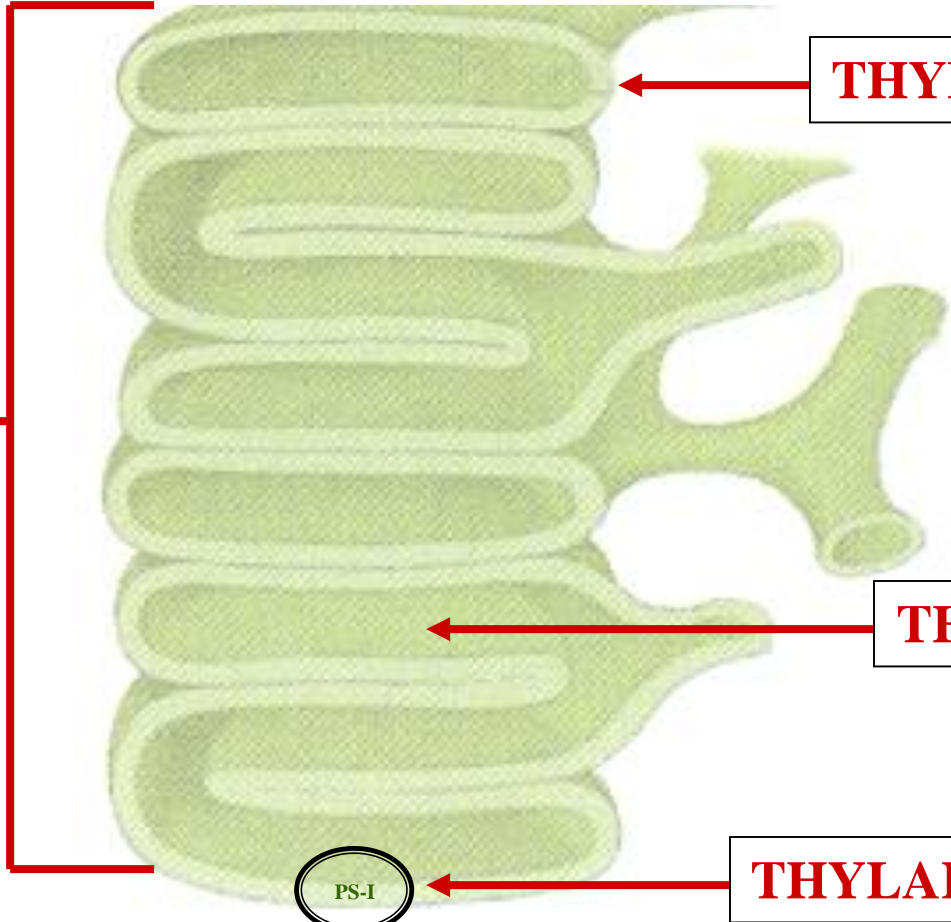
THYLAKOID VESICLE

STROMA

THYLAKOID SPACE

THYLAKOID MEMBRANE

CYCLIC P-P



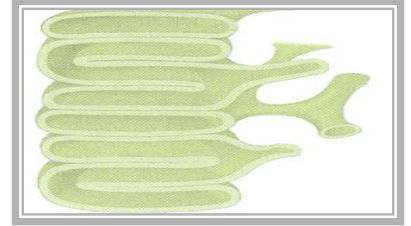
CHLOROPLAST

PS-I

THYLAKOID



**PIGMENT
MOLECULES**



A

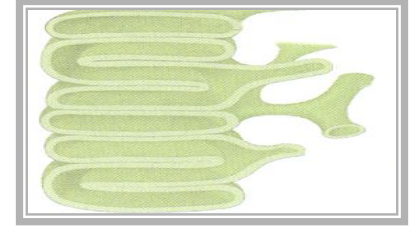
CHLOROPLAST

PS-I

THYLAKOID



**ANTENNA
MOLECULES**



A

ANTENNA MOLECULES

ANTENNA MOLECULES

ABSORB LIGHT ENERGY



ANTENNA MOLECULES



ANTENNA MOLECULES

ABSORB LIGHT ENERGY



REACTION CENTER

ANTENNA MOLECULES

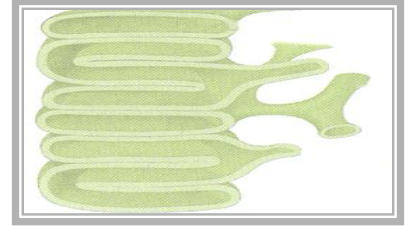
CHLOROPLAST

PS-I

THYLAKOID



**ANTENNA
MOLECULES**



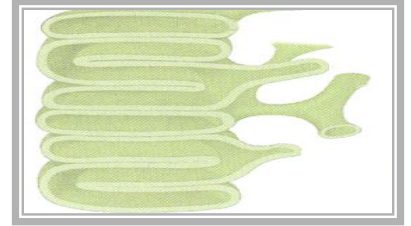
CHLOROPLAST

PS-I

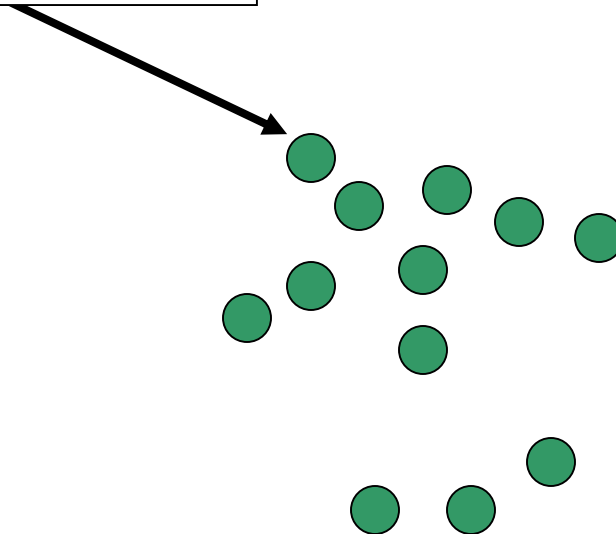
THYLAKOID



**ANTENNA
MOLECULES**



CHLOROPHYLLA



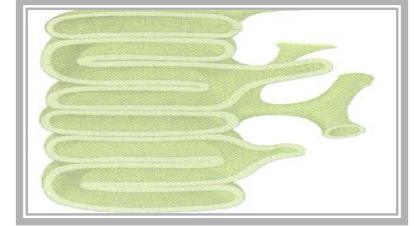
CHLOROPLAST

PS-I

THYLAKOID

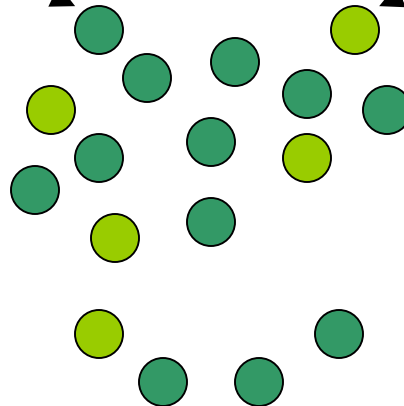


**ANTENNA
MOLECULES**



CHLOROPHYLL A

CHLOROPHYLL B



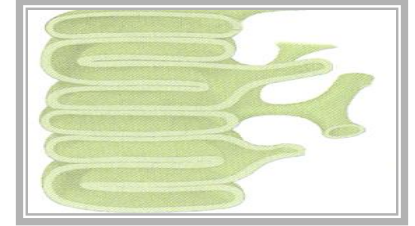
CHLOROPLAST

PS-I

THYLAKOID



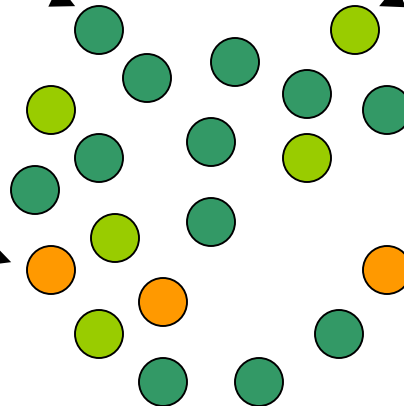
**ANTENNA
MOLECULES**



CHLOROPHYLL A

CHLOROPHYLL B

CAROTENES



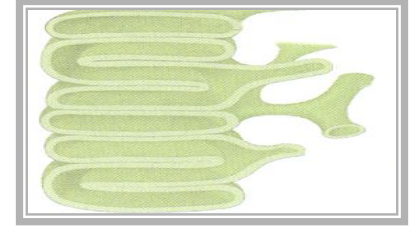
CHLOROPLAST

PS-I

THYLAKOID



**ANTENNA
MOLECULES**

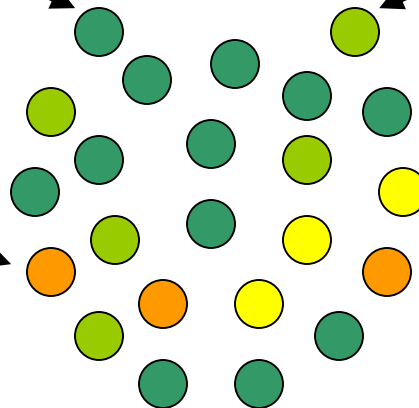


CHLOROPHYLLA

CHLOROPHYLL B

CAROTENES

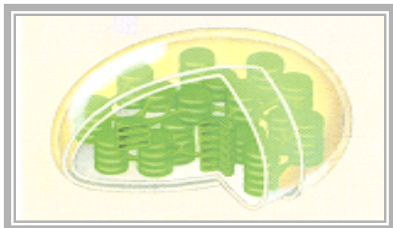
XANTHOPHYLLS



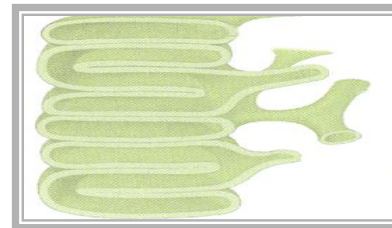
CHLOROPLAST

PS-I

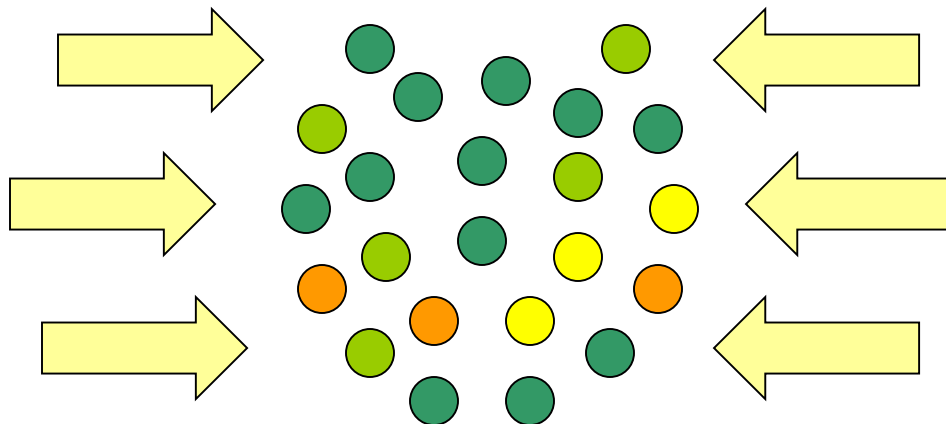
THYLAKOID



**ANTENNA
MOLECULES**



LTEGY



LTEGY

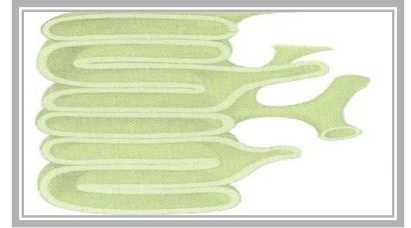
CHLOROPLAST

PS-I

THYLAKOID



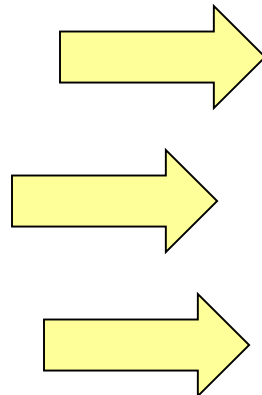
**ANTENNA
MOLECULES**



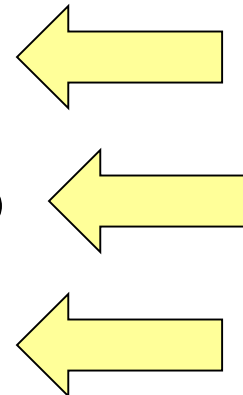
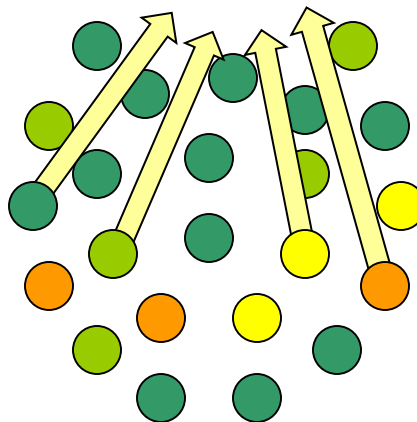
R



LTEGY



LTEGY



LTEGY

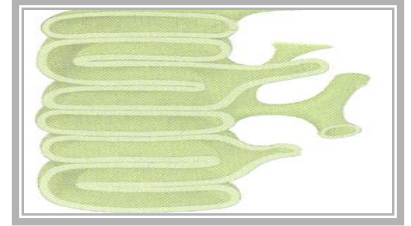
CHLOROPLAST

PS-I

THYLAKOID



**ANTENNA
MOLECULES**

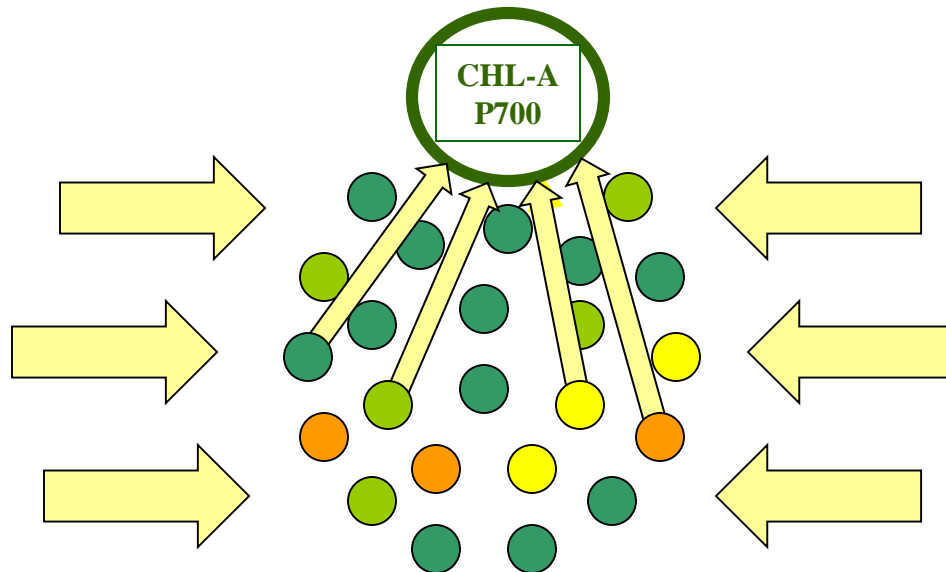


R

REACTION CENTER



LTEGY



LTEGY



REACTION CENTER PS-I



REACTION CENTER PS-I

CHL A/PROTEIN COMPLEX

PIGMENT 700

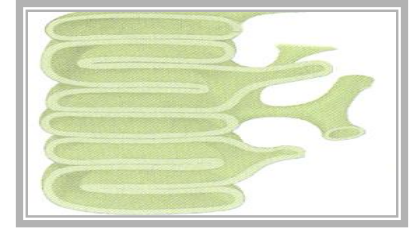
P700

REACTION CENTER PS-I

CHLOROPLAST

PS-I

THYLAKOID



REACTION CENTER: ABSORBS SUFFICIENT LIGHT ENERGY

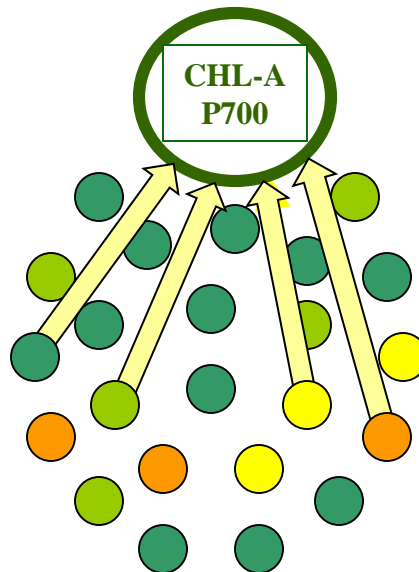
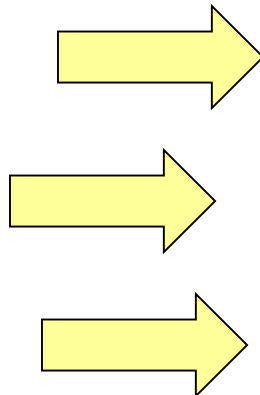
E-



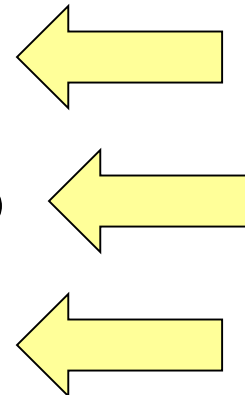
REACTION CENTER



LTEGY



LTEGY

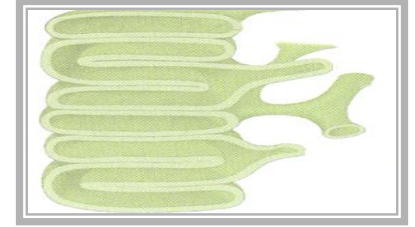


CHLOROPLAST



PS-I

THYLAKOID



 = ENERGY

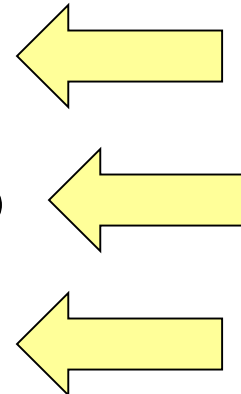
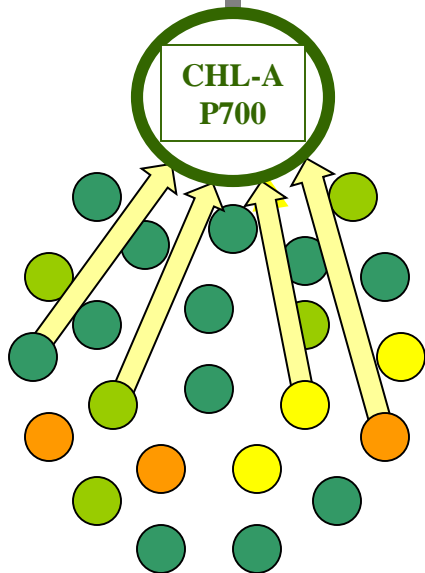
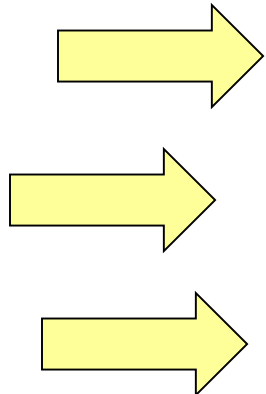
ENERGIZED E-

AC
Q2

**CHL-A
P700**



LTEGY



LTEGY

E-

CHLOROPLAST

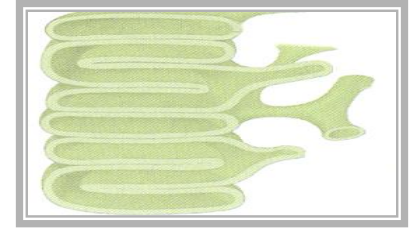


E- ACCEPTOR "Q2"



LTEGY

THYLAKOID

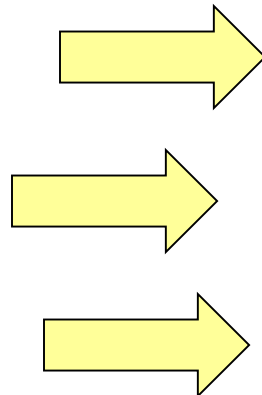


E- ACCEPTOR "Q2": ACCEPTS ENERGIZED E-

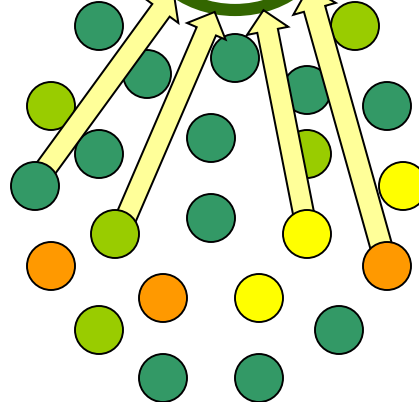
C



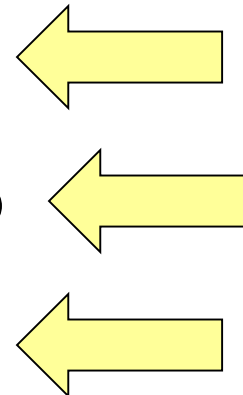
LTEGY



CHL-A
P700



LTEGY



CHLOROPLAST

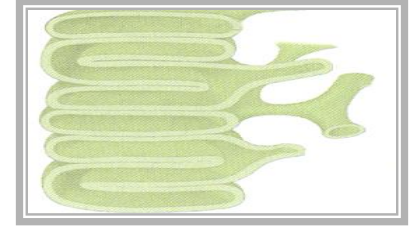


E- ACCEPTOR "Q2"



CHEM EGY

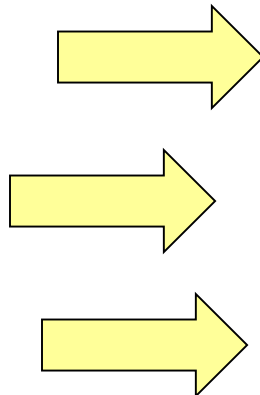
THYLAKOID



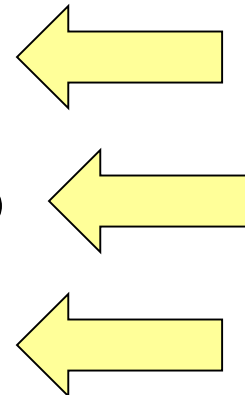
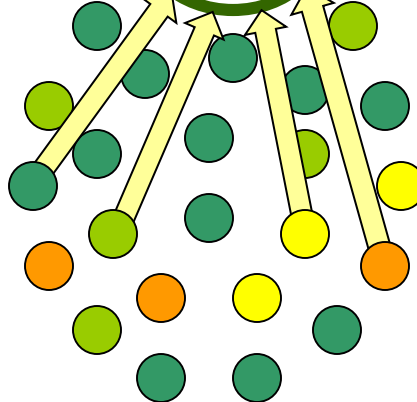
E- ACCEPTOR "Q2": ACCEPTS ENERGIZED E-



LTEGY



CHL-A
P700



LTEGY

P700
REDOX RXT

CHLOROPLAST

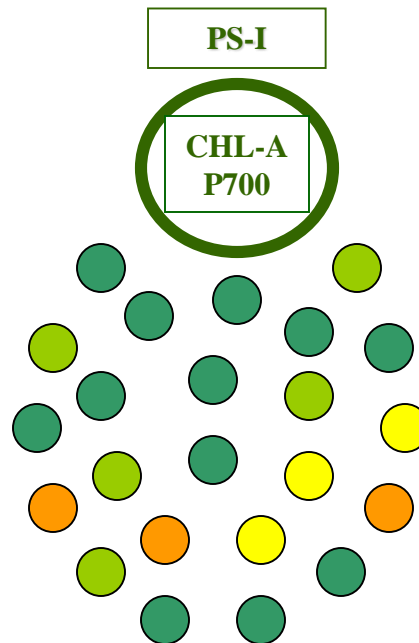
E- ACCEPTOR "Q2"



CHEM EGY

THYLAKOID

R



CHLOROPLAST

E- ACCEPTOR "Q2"

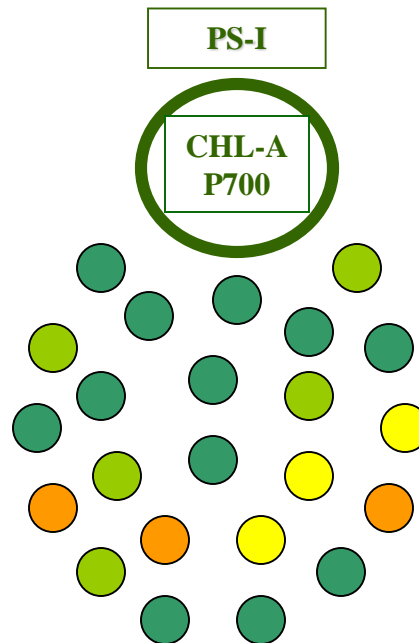


CHEM EGY

THYLAKOID

"Q2" REDUCED

O



CHLOROPLAST

E- ACCEPTOR "Q2"



CHEM EGY

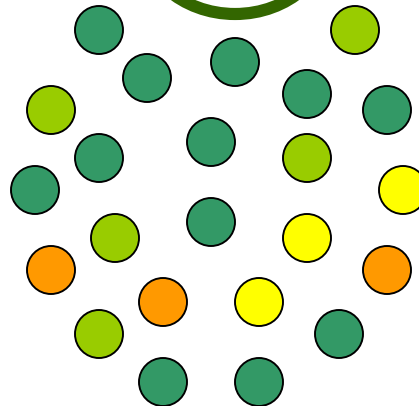
THYLAKOID

"Q2" REDUCED

C

PS-I

CHL-A
P700



P700 OXIDIZED

CHLOROPLAST

E- ACCEPTOR "Q2"



CHEM EGY

THYLAKOID

"Q2" REDUCED

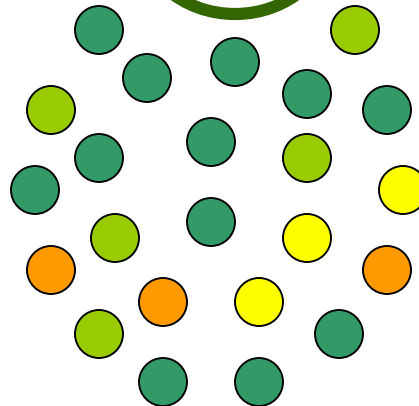


COUPLED

P700 OXIDIZED

PS-I

CHL-A
P700



CHLOROPLAST

E- ACCEPTOR "Q2"



CHEM EGY

THYLAKOID

ETC1

?

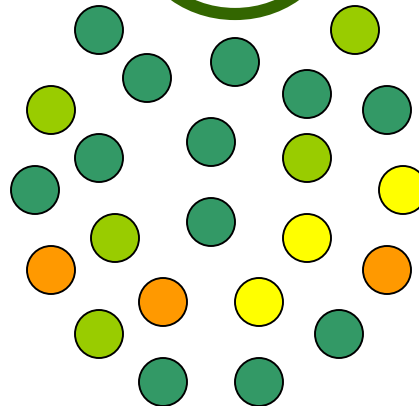
NON-CYCLIC P-P

E-

PS-I

**CHL-A
P700**

P700 OXIDIZED



CHLOROPLAST

E- ACCEPTOR "Q2"



CHEM EGY

THYLAKOID

ETC1

+

E- TRANSPORT CHAIN #1

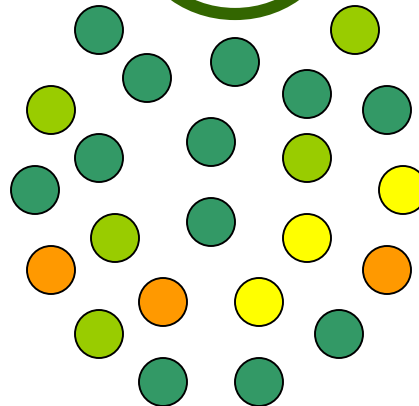
NON-CYCLIC P-P

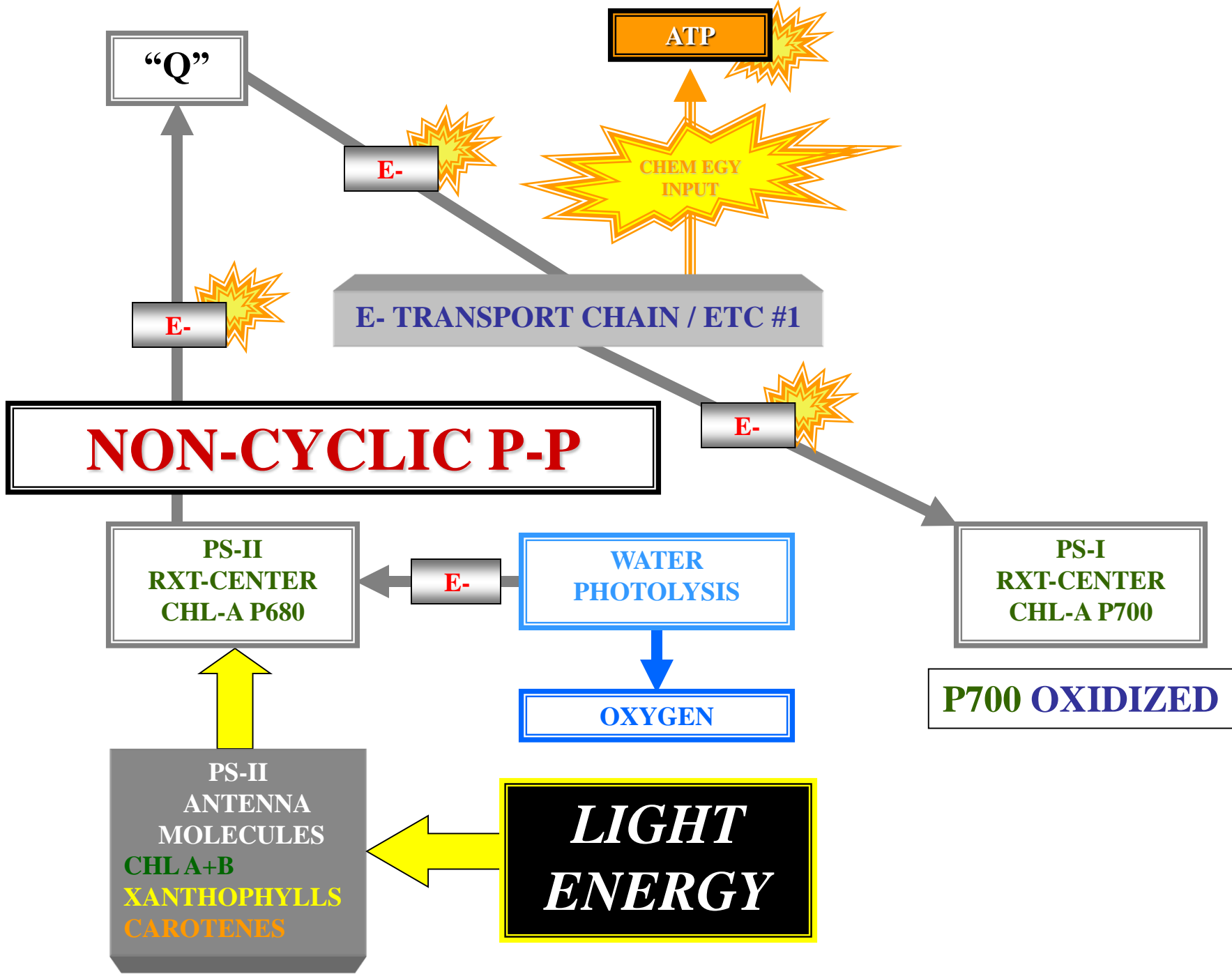
E-

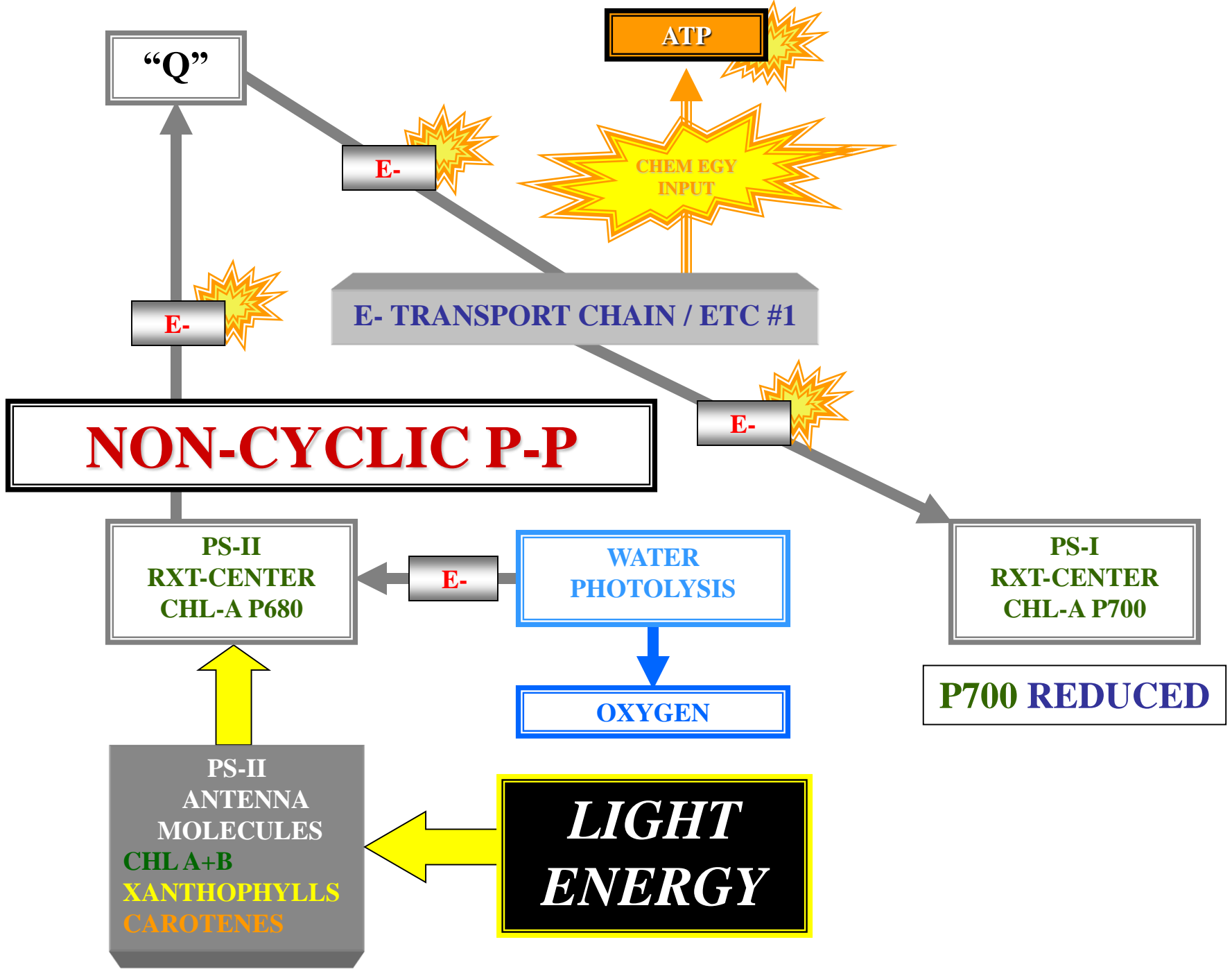
PS-I

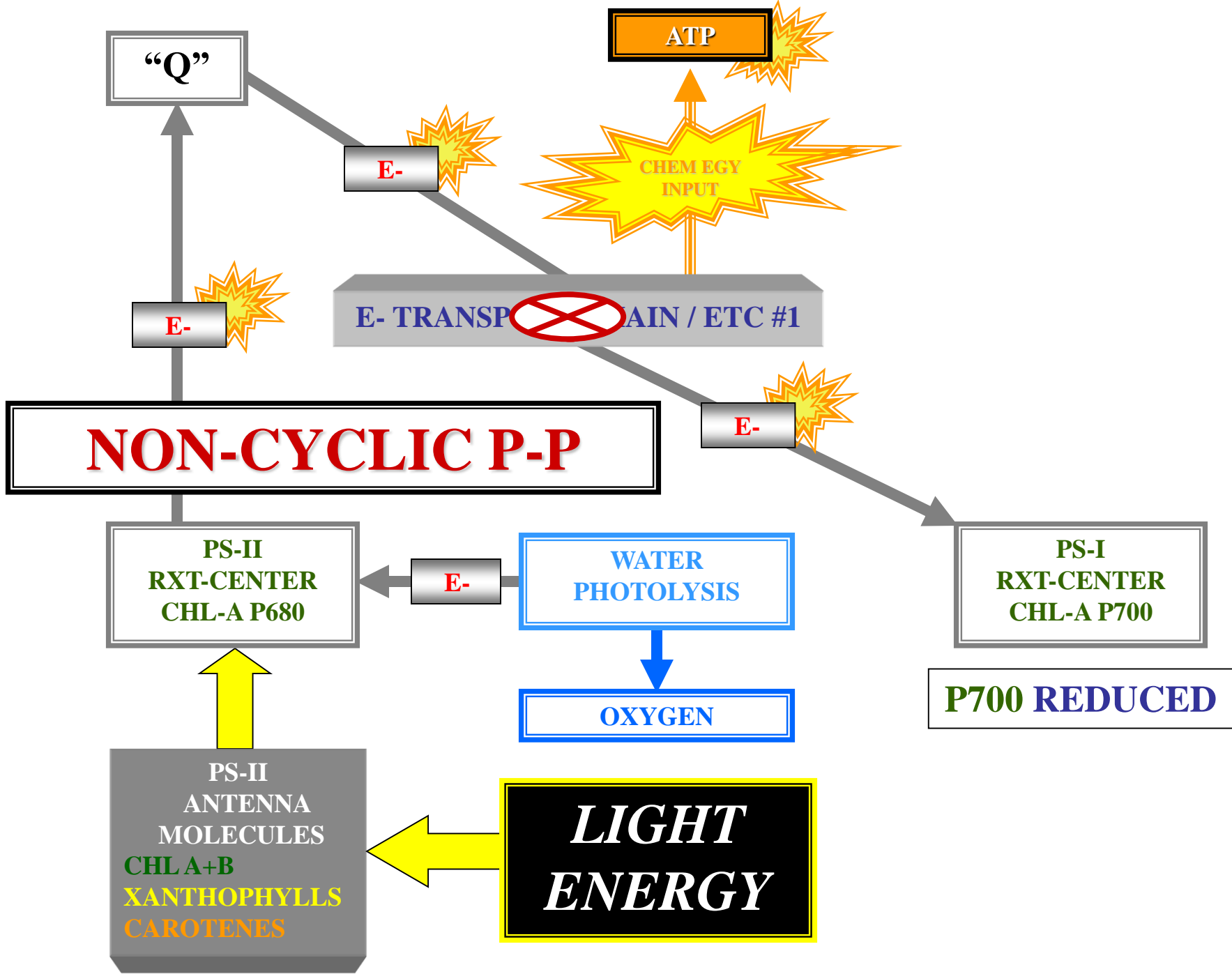
**CHL-A
P700**

P700 OXIDIZED





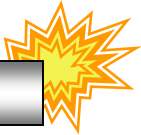




CYCLIC P-P

“Q2”

E-

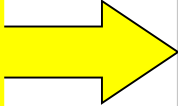


ENERGIZED E-

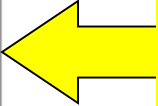
**PS-I
RXT-CENTER
CHL-A P700**

P700 OXIDIZED

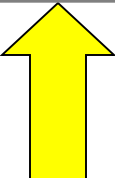
**LIGHT
ENERGY**

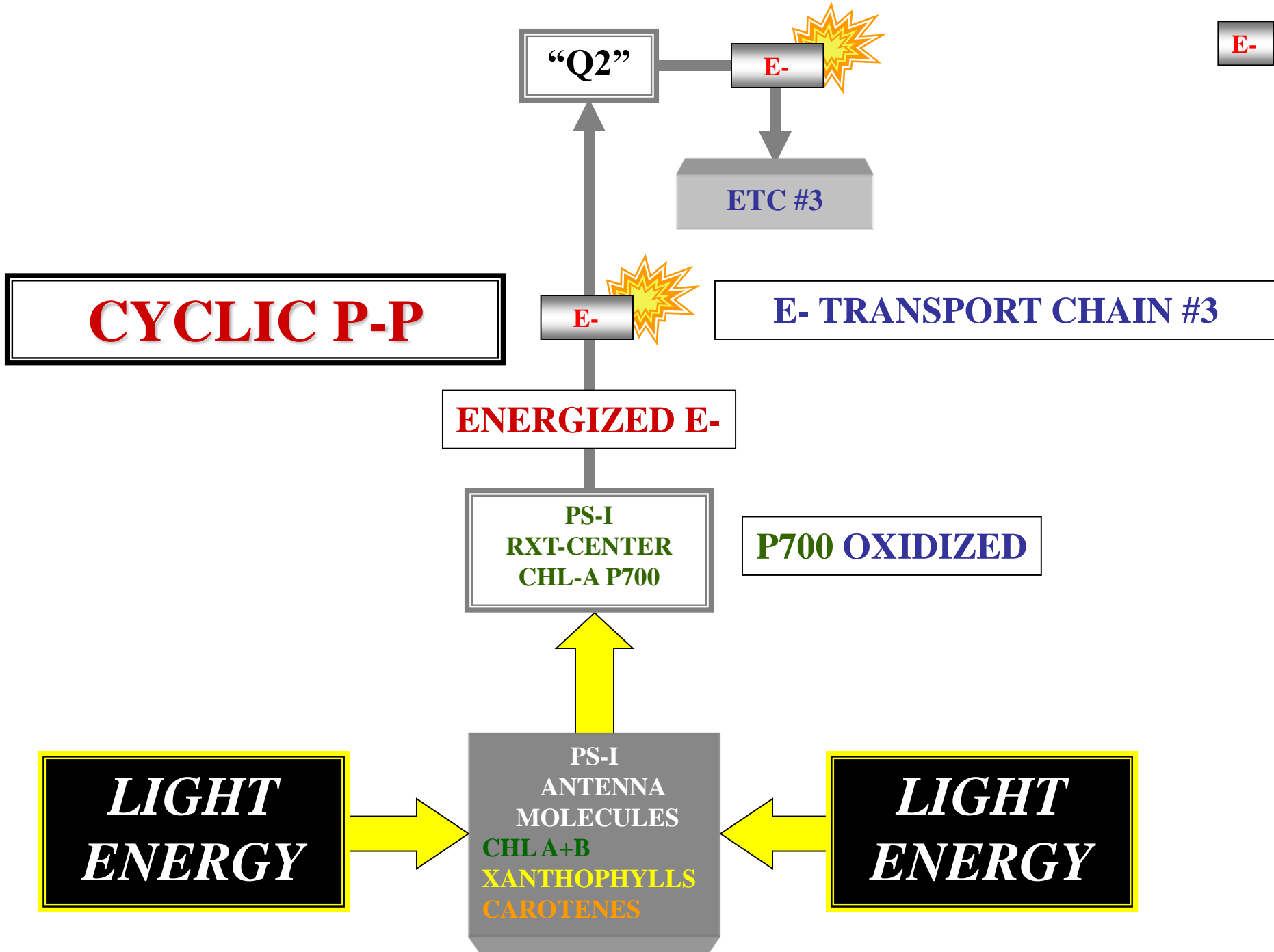


**PS-I
ANTENNA
MOLECULES
CHL A+B
XANTHOPHYLLS
CAROTENES**



**LIGHT
ENERGY**





CYCLIC P-P

“Q2”

E-

ETC #3

E-

E-

E- TRANSPORT CHAIN #3

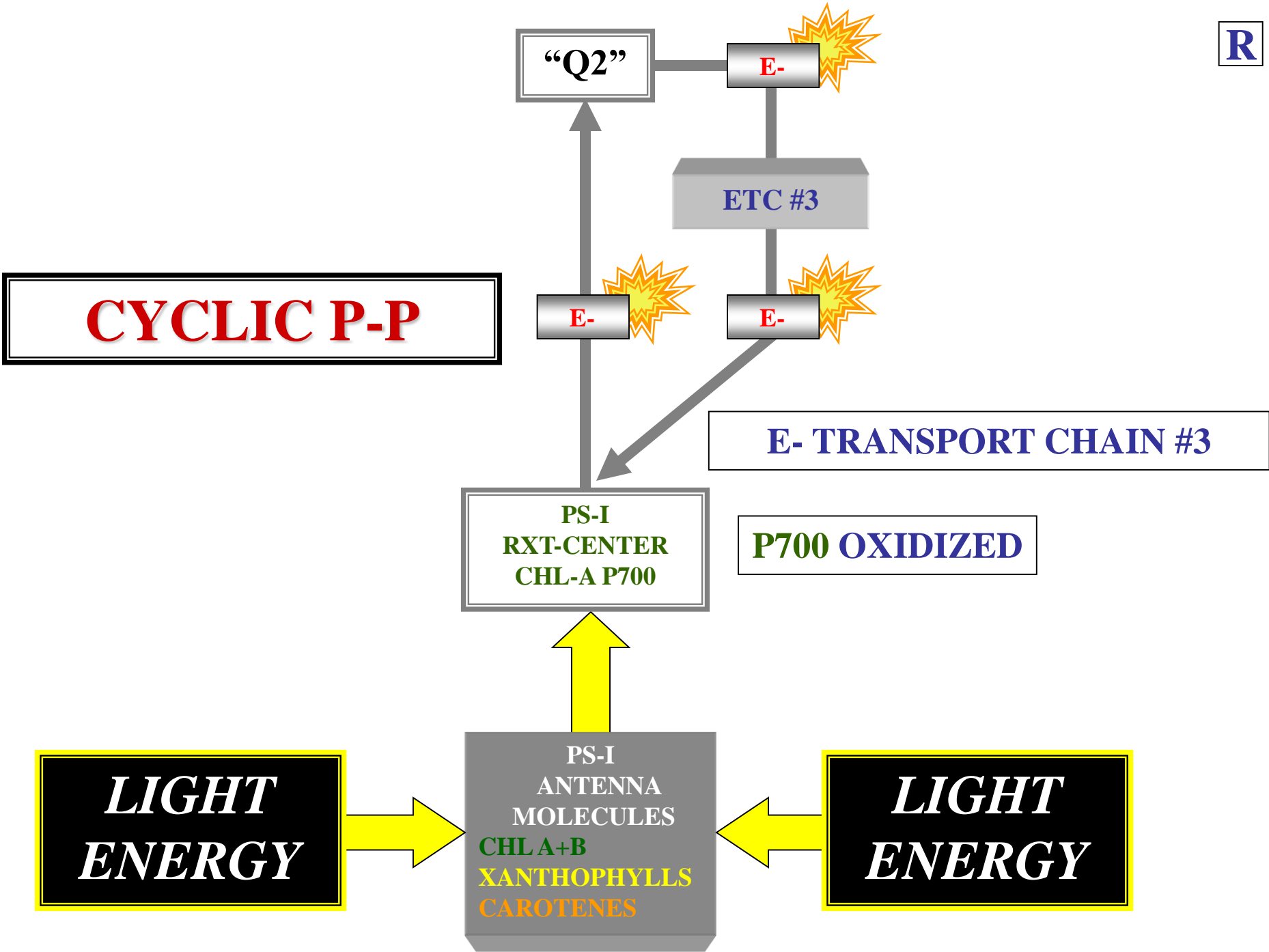
**PS-I
RXT-CENTER
CHL-A P700**

P700 OXIDIZED

**LIGHT
ENERGY**

**PS-I
ANTENNA
MOLECULES
CHL A+B
XANTHOPHYLLS
CAROTENES**

**LIGHT
ENERGY**



CYCLIC P-P

"Q2"

E-

ETC #3



REMEMBER

E-

E-

E- TRANSPORT CHAIN #3

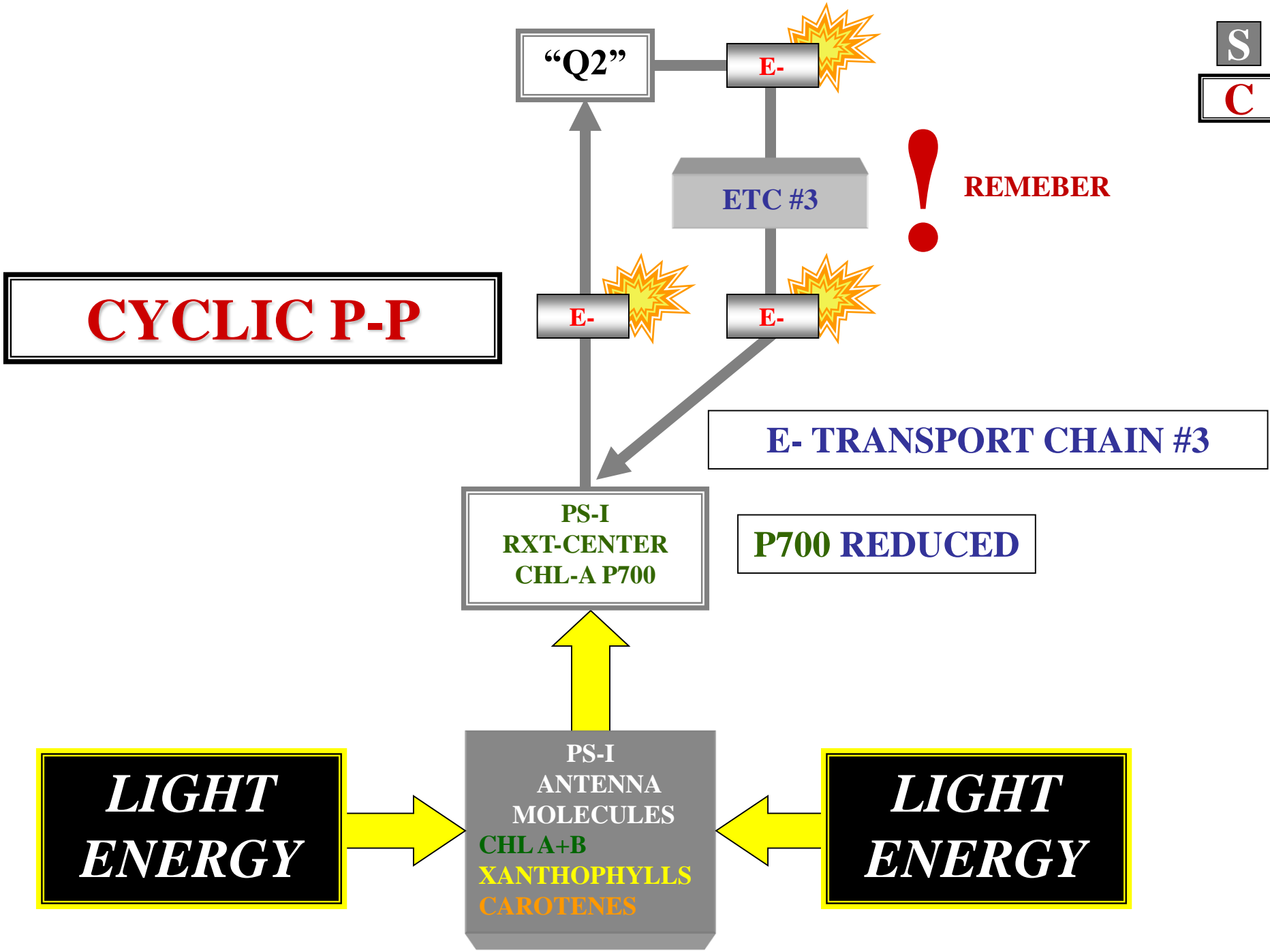
**PS-I
RXT-CENTER
CHL-A P700**

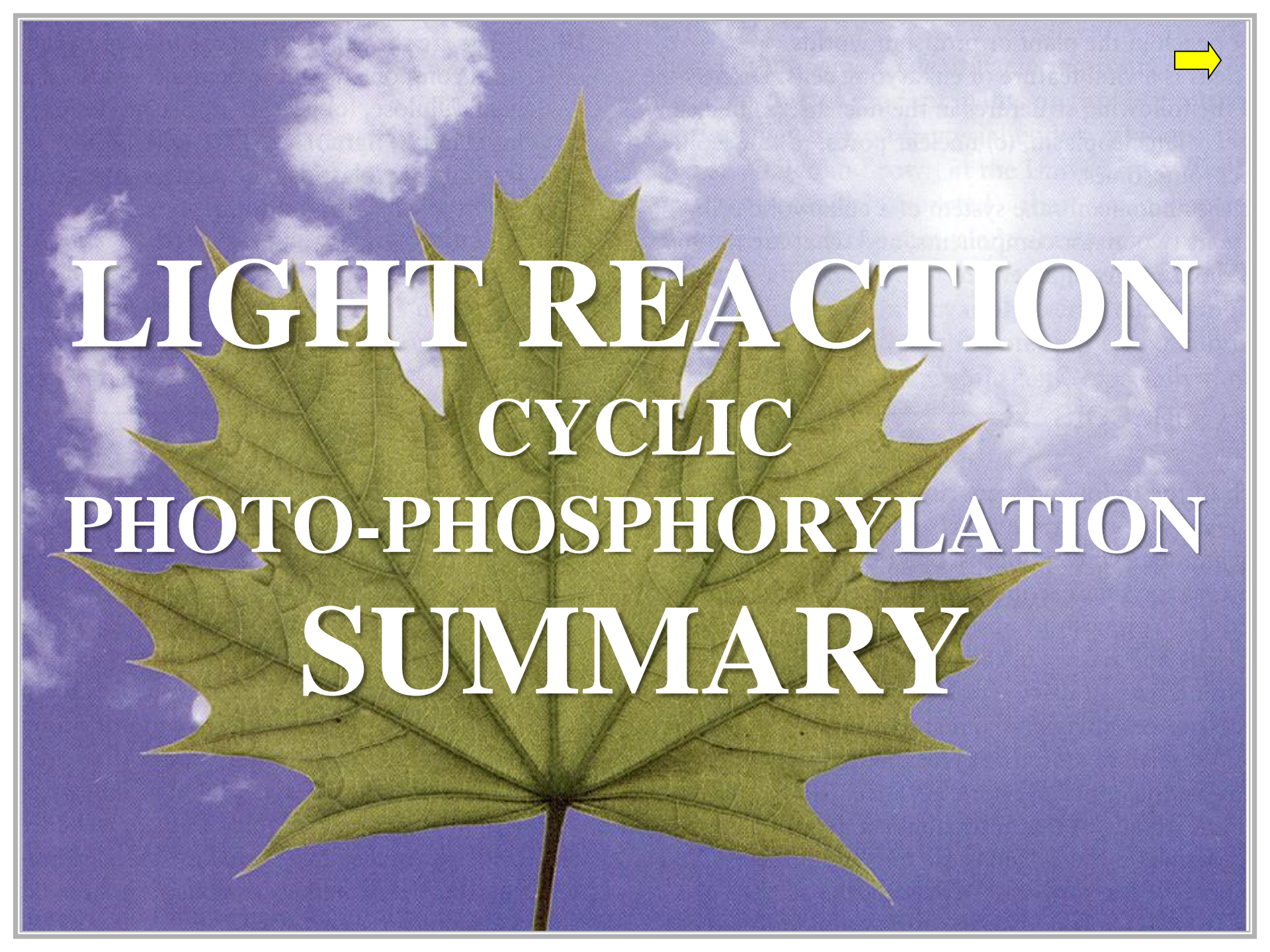
P700 REDUCED

LIGHT ENERGY

**PS-I
ANTENNA
MOLECULES
CHL A+B
XANTHOPHYLLS
CAROTENES**

LIGHT ENERGY



A large green maple leaf is centered on a blue sky with white clouds. The text is overlaid on the leaf.

LIGHT REACTION
CYCLIC
PHOTO-PHOSPHORYLATION
SUMMARY



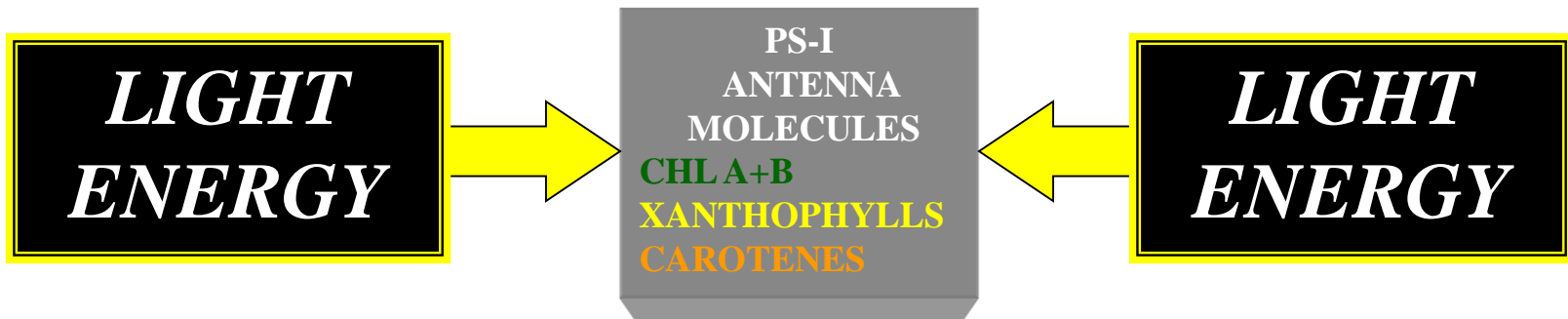
CYCLIC P-P

*LIGHT
ENERGY*

*LIGHT
ENERGY*



CYCLIC P-P





CYCLIC P-P

REACTION CENTER: **ABSORBS SUFFICIENT LIGHT ENERGY**

