

**NON-COMPETITIVE
INHIBITOR**

NON-COMPETITIVE INHIBITOR



BINDS WITH ALLOSTERIC SITE

NON-COMPETITIVE INHIBITOR

NON-COMPETITIVE INHIBITOR



BINDS WITH ALLOSTERIC SITE

DOES NOT OCCUPY A.S.

NON-COMPETITIVE INHIBITOR

NON-COMPETITIVE INHIBITOR



BINDS WITH ALLOSTERIC SITE

DOES NOT OCCUPY A.S.

CHANGES A.S. CONFORMATION

NON-COMPETITIVE INHIBITOR

NON-COMPETITIVE INHIBITOR



BINDS WITH ALLOSTERIC SITE

DOES NOT OCCUPY A.S.

CHANGES A.S. CONFORMATION

BLOCKS SUB/ENZ INTERACTION

NON-COMPETITIVE INHIBITOR

NON-COMPETITIVE INHIBITOR

BINDS WITH ALLOSTERIC SITE



DOES NOT OCCUPY A.S.

CHANGES A.S. CONFORMATION

BLOCKS SUB/ENZ INTERACTION

OUTCOME

NO PRODUCT OUTPUT

NON-COMPETITIVE INHIBITOR

NON-COMPETITIVE INHIBITOR



**NON-COMPETITIVE
INHIBITOR**



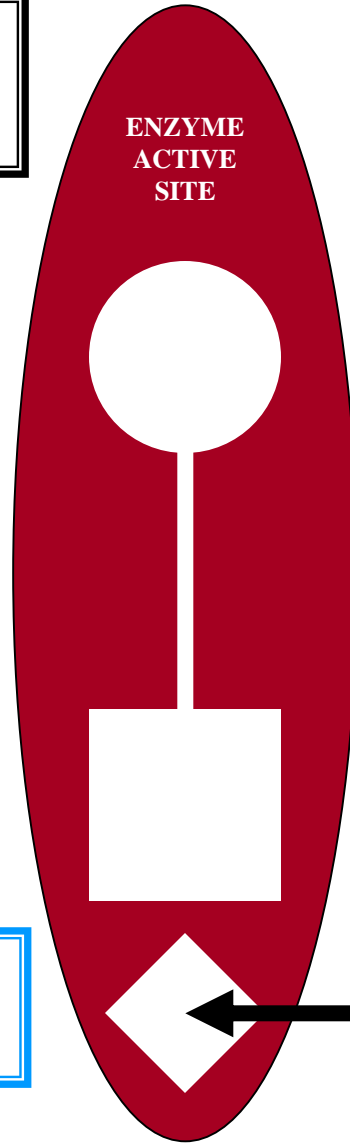
SUBSTRATE

**NON-COMPETITIVE
INHIBITOR**



SUBSTRATE

ENZYME
ACTIVE
SITE



**ALLOSTERIC
SITE**

ENZYME



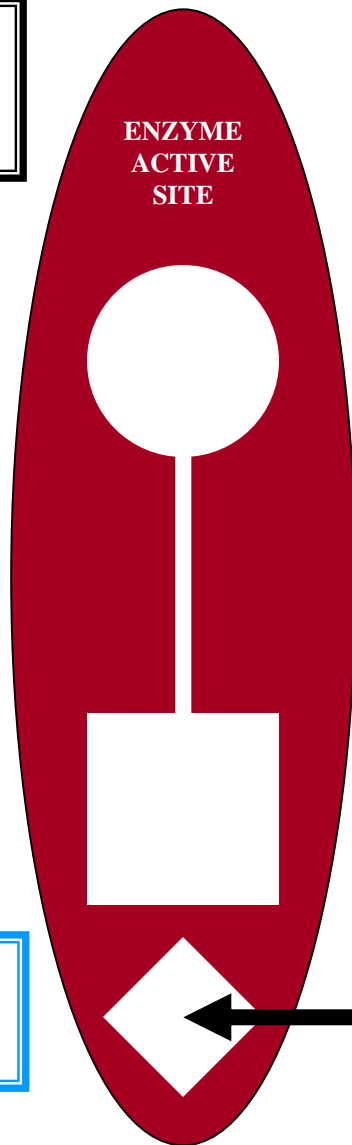
**NON-COMPETITIVE
INHIBITOR**

**ENZYME
INHIBITOR**



SUBSTRATE

ENZYME
ACTIVE
SITE



**ALLOSTERIC
SITE**

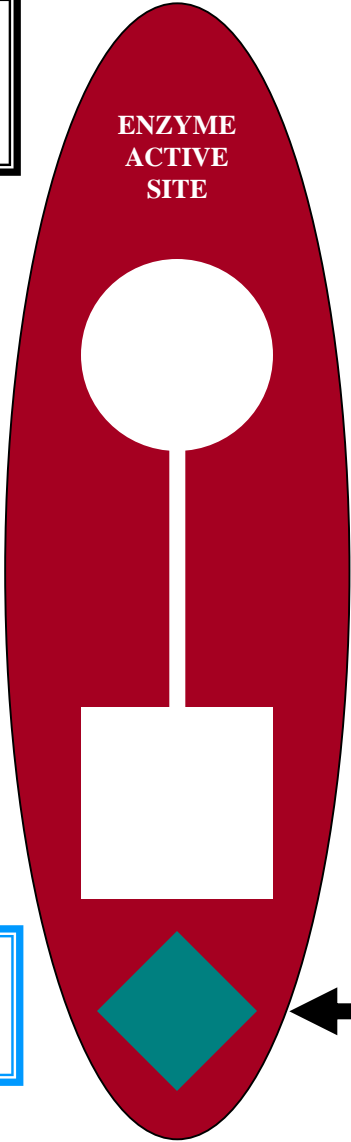
ENZYME



**NON-COMPETITIVE
INHIBITOR**

**ENZYME
INHIBITOR
BINDS WITH
ALLOSTERIC
SITE**

SUBSTRATE



**ALLOSTERIC
SITE**

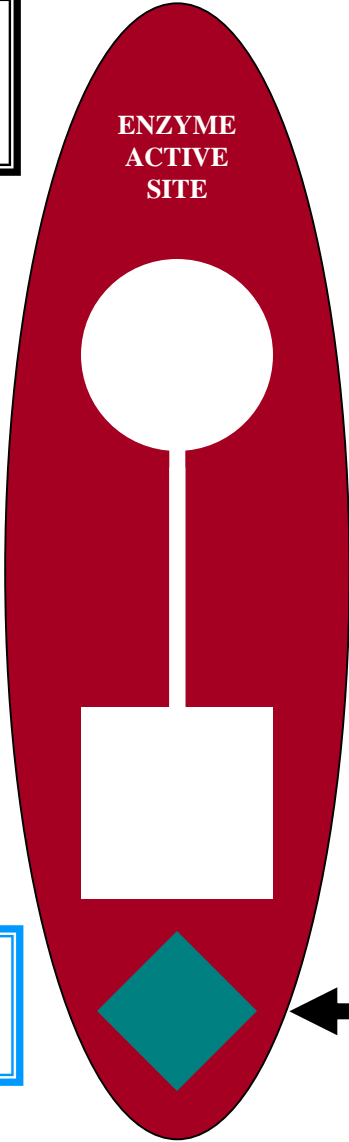
ENZYME

**NON-COMPETITIVE
INHIBITOR**

**ENZYME
INHIBITOR
DOES NOT
OCCUPY
ACTIVE SITE**



SUBSTRATE



ENZYME
ACTIVE
SITE

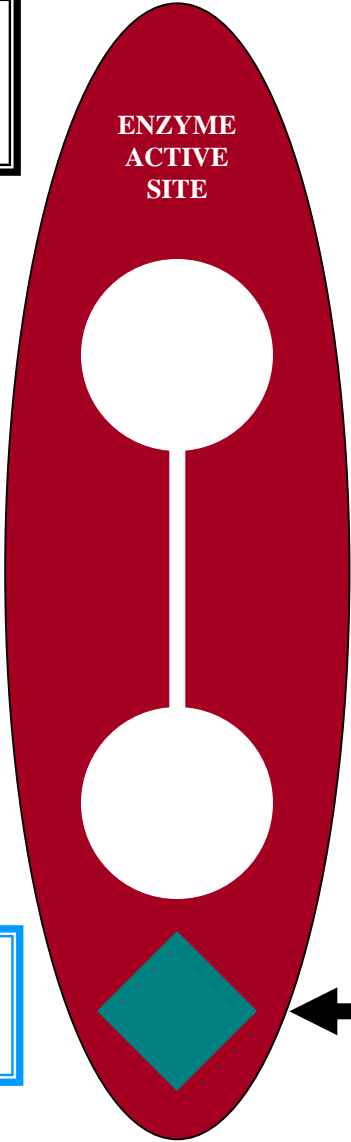
**ALLOSTERIC
SITE**

ENZYME

**NON-COMPETITIVE
INHIBITOR**



SUBSTRATE



ENZYME
ACTIVE
SITE

**ENZYME
INHIBITOR
CHANGES
ACTIVE SITE
CONFORMATION**

**ALLOSTERIC
SITE**

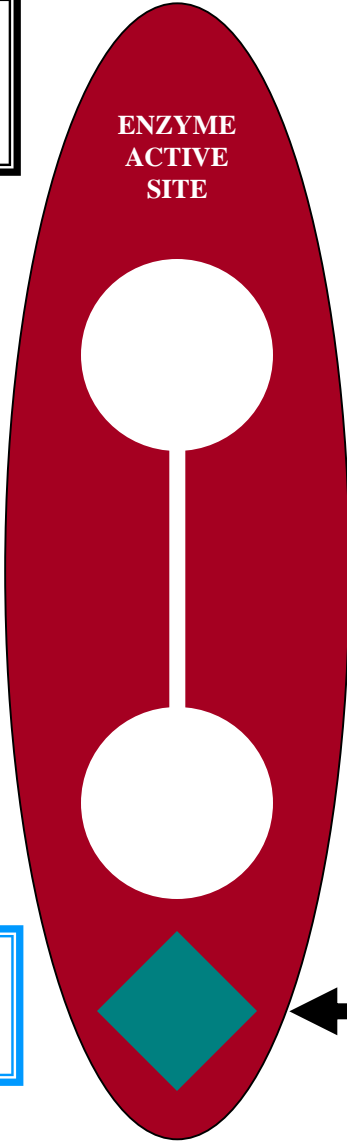
ENZYME



**NON-COMPETITIVE
INHIBITOR**



SUBSTRATE



ENZYME
ACTIVE
SITE

**ENZYME
INHIBITOR
BLOCKS
SUB/ENZ
INTERACTION**

**ALLOSTERIC
SITE**

ENZYME

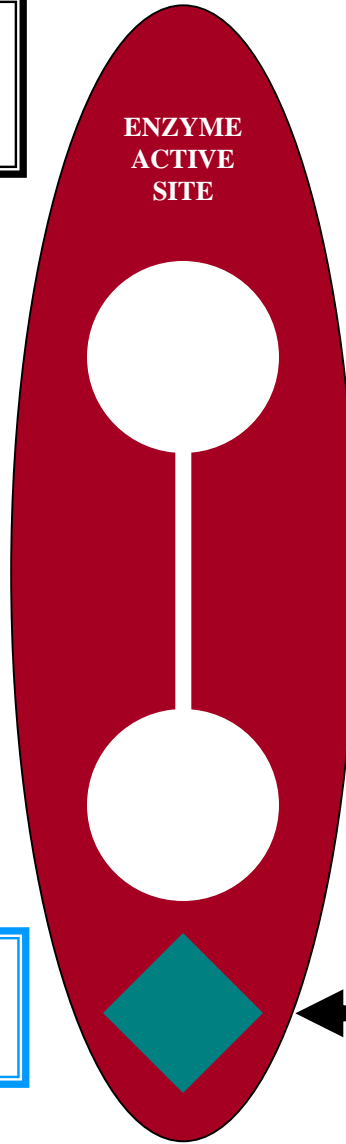


**NON-COMPETITIVE
INHIBITOR**



SUBSTRATE

ENZYME
ACTIVE
SITE



**NO
PRODUCT
OUTPUT**

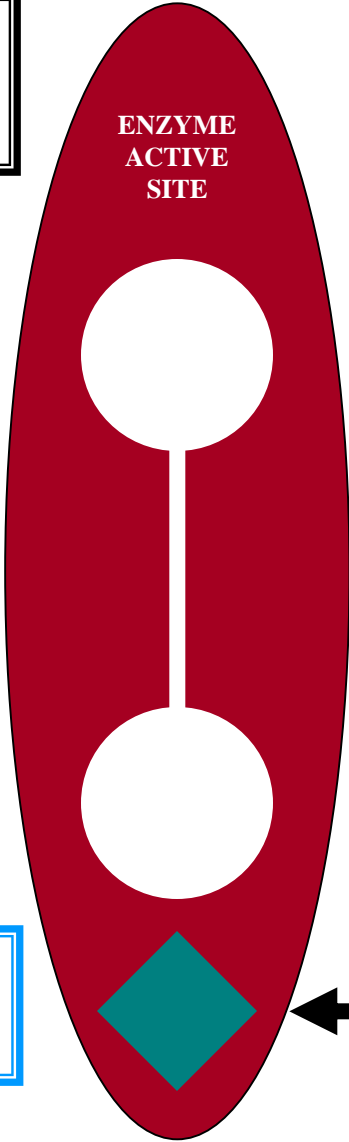
**ALLOSTERIC
SITE**

ENZYME

**NON-COMPETITIVE
INHIBITOR**



SUBSTRATE



**?
ENZYME
INHIBITOR**

**NO
PRODUCT
OUTPUT**

**ENZYME
INHIBITOR**

ENZYME



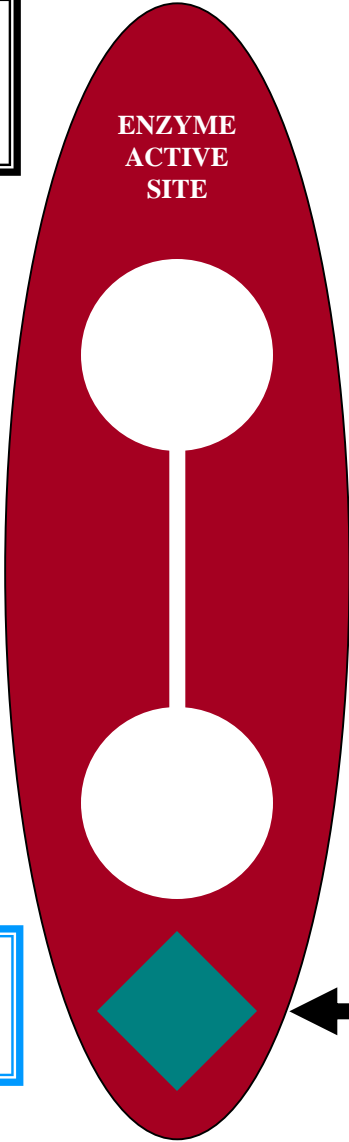
**NON-COMPETITIVE
INHIBITOR**

**NON-COMPETITIVE
ENZYME
INHIBITOR**

**NO
PRODUCT
OUTPUT**

**ENZYME
INHIBITOR**

SUBSTRATE



ENZYME

***ENZYME
INHIBITORS
REGULATE
METABOLISM***

***EFFICIENT
CELL
METABOLISM***



HOMEOSTASIS





ENZYME REGULATION

FEED-BACK REGULATION

FEED-BACK REGULATION



FEED-BACK REGULATION

**PRODUCT SERVES
AS INHIBITOR**

FEED-BACK REGULATION

FEED-BACK REGULATION



-- PRODUCT OCCUPIES ACTIVE SITE

FEED-BACK REGULATION

FEED-BACK REGULATION



-- PRODUCT OCCUPIES ACTIVE SITE

PRODUCT BLOCKS SUB/ENZ INTERACTION

FEED-BACK REGULATION

FEED-BACK REGULATION



-- PRODUCT OCCUPIES ACTIVE SITE

PRODUCT BLOCKS SUB/ENZ INTERACTION

PRODUCT = INHIBITOR →

FEED-BACK REGULATION

FEED-BACK REGULATION



-- PRODUCT OCCUPIES ACTIVE SITE

PRODUCT BLOCKS SUB/ENZ INTERACTION

PRODUCT = INHIBITOR →

NO PRODUCT OUTPUT

FEED-BACK REGULATION

FEED-BACK REGULATION



-- PRODUCT OCCUPIES ACTIVE SITE

PRODUCT BLOCKS SUB/ENZ INTERACTION

PRODUCT = INHIBITOR →

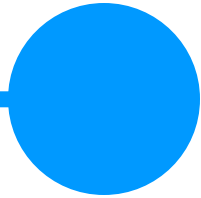
NO PRODUCT OUTPUT

-- MAINTAINS SUBSTRATE/PRODUCT EQUALIBRIUM

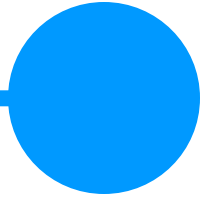
FEED-BACK REGULATION

METABOLISM

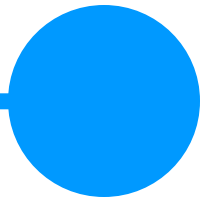
SUBSTRATE



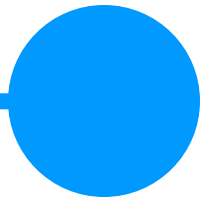
SUBSTRATE



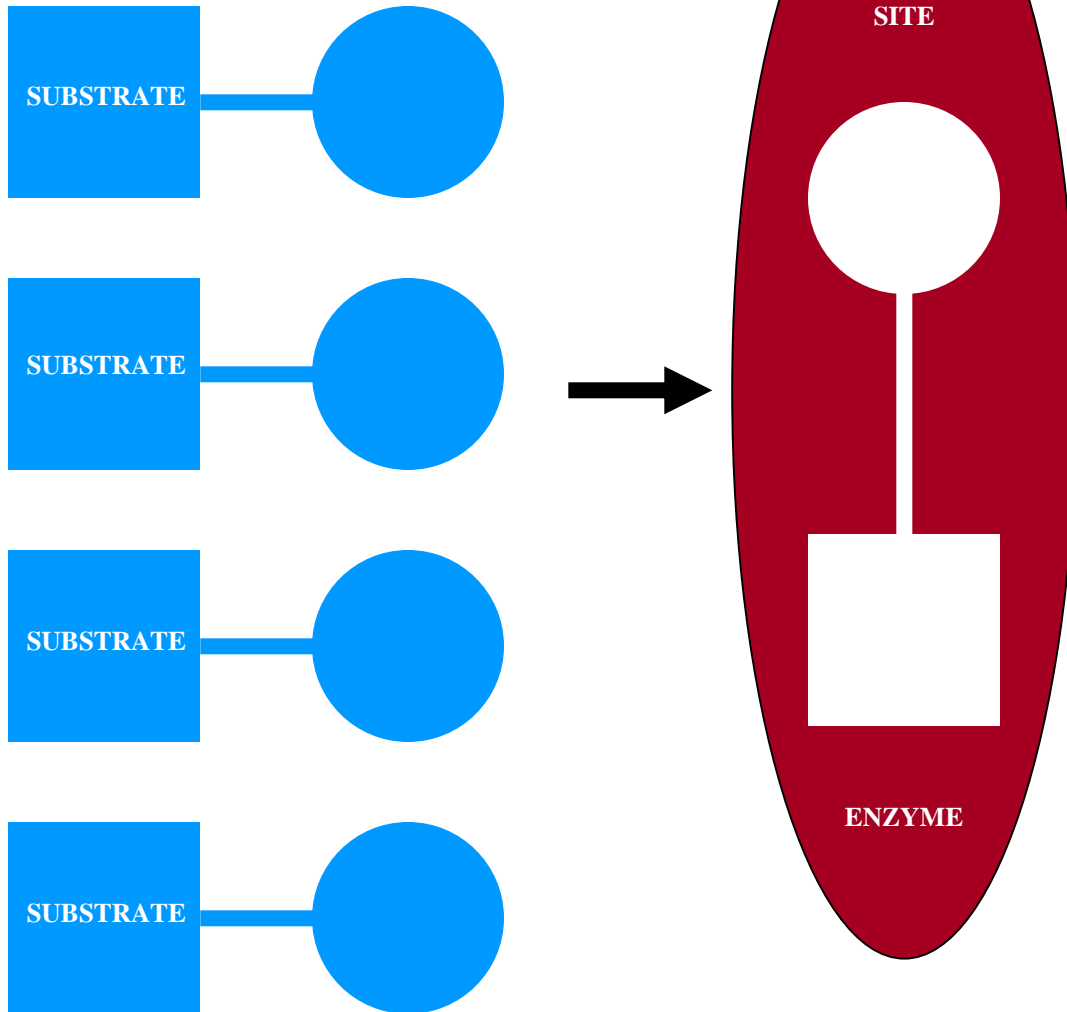
SUBSTRATE



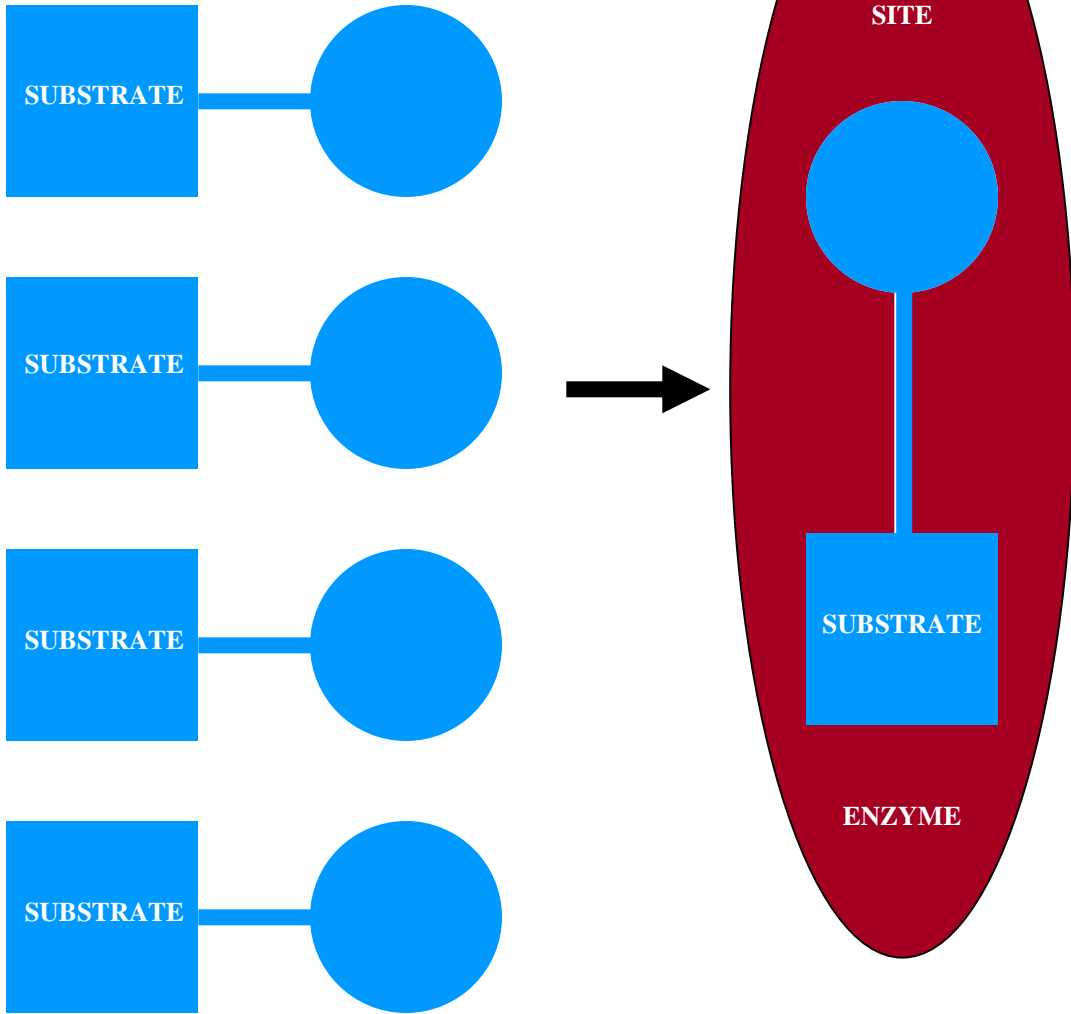
SUBSTRATE



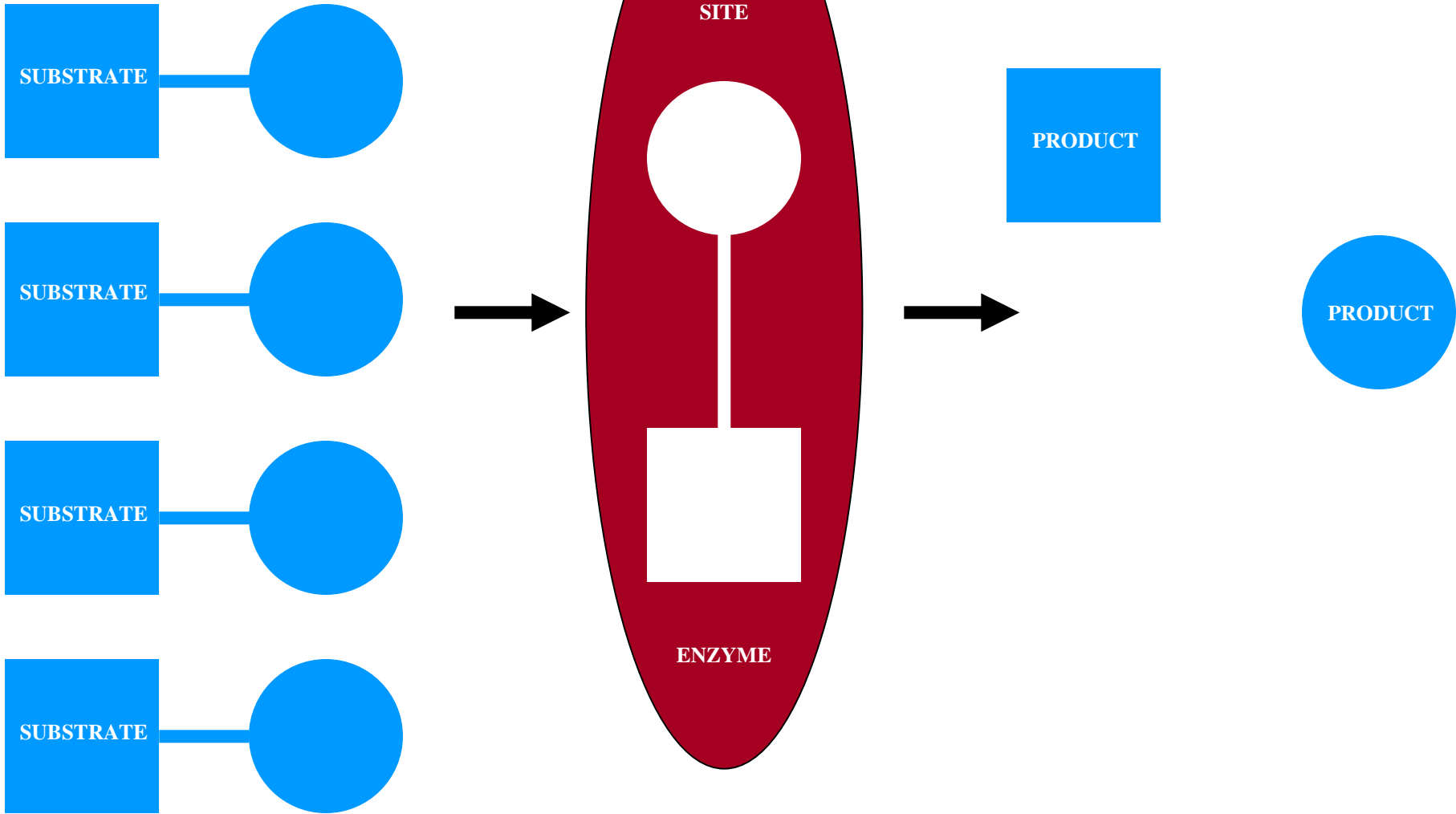
METABOLISM



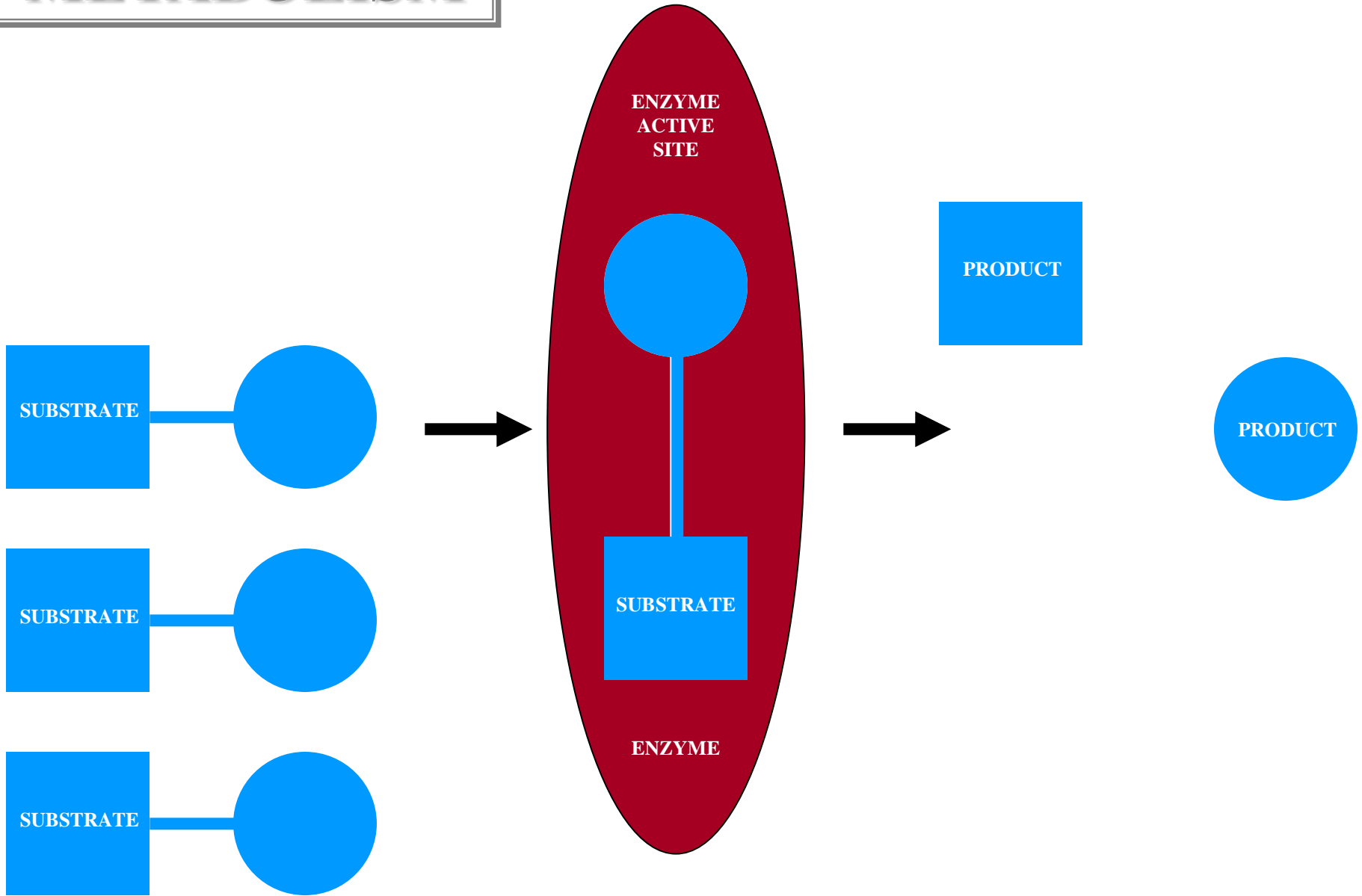
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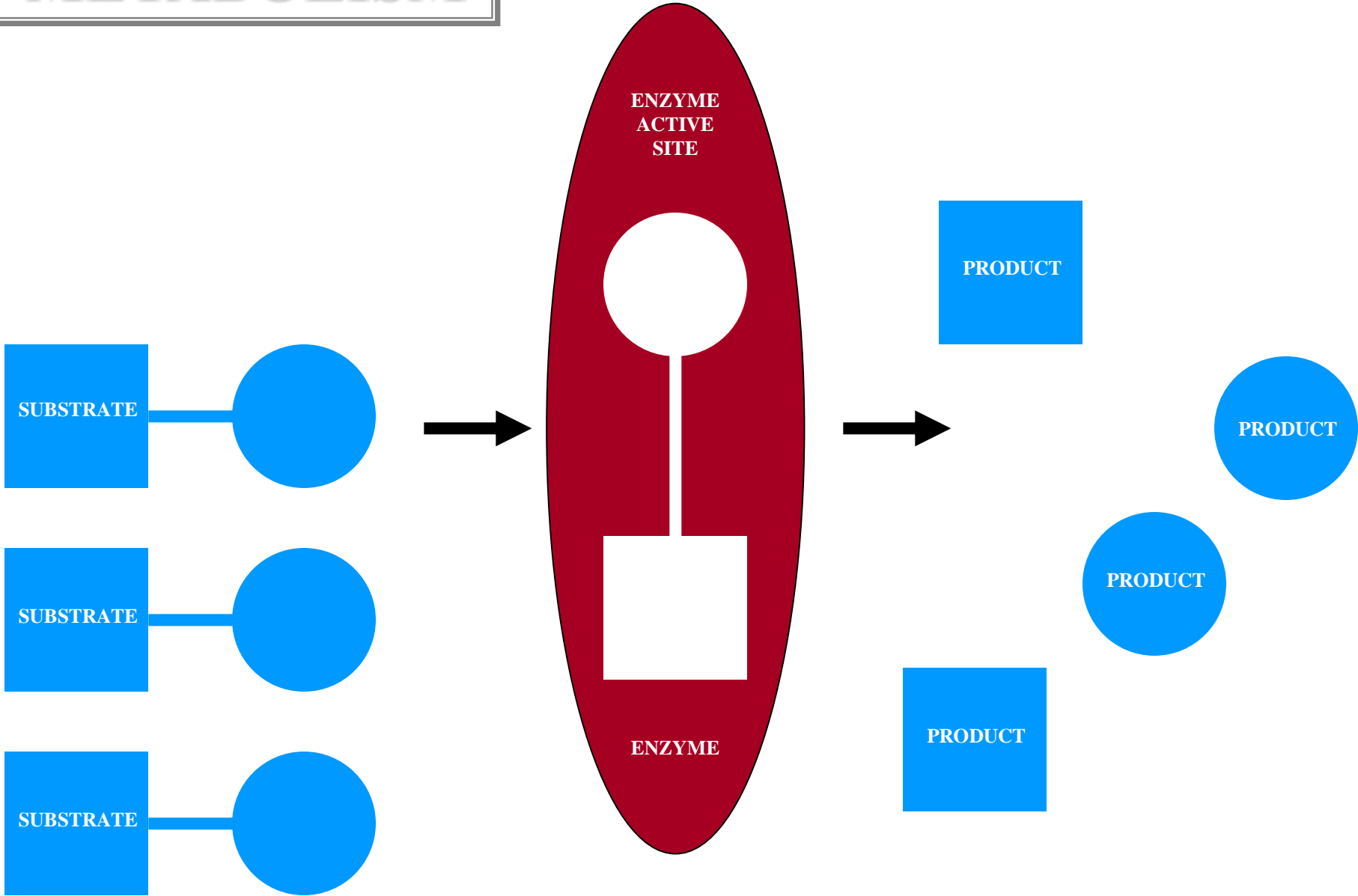
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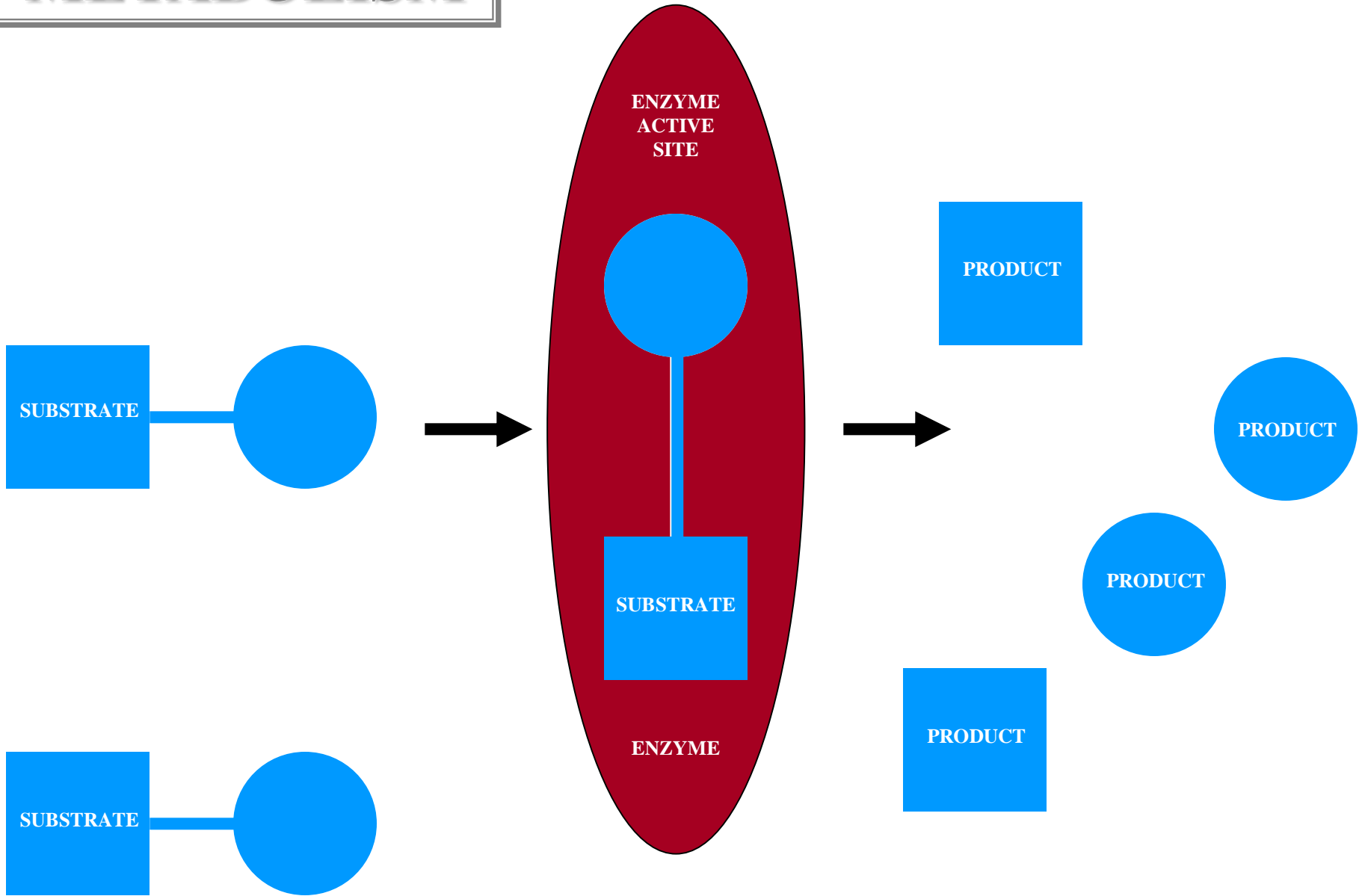
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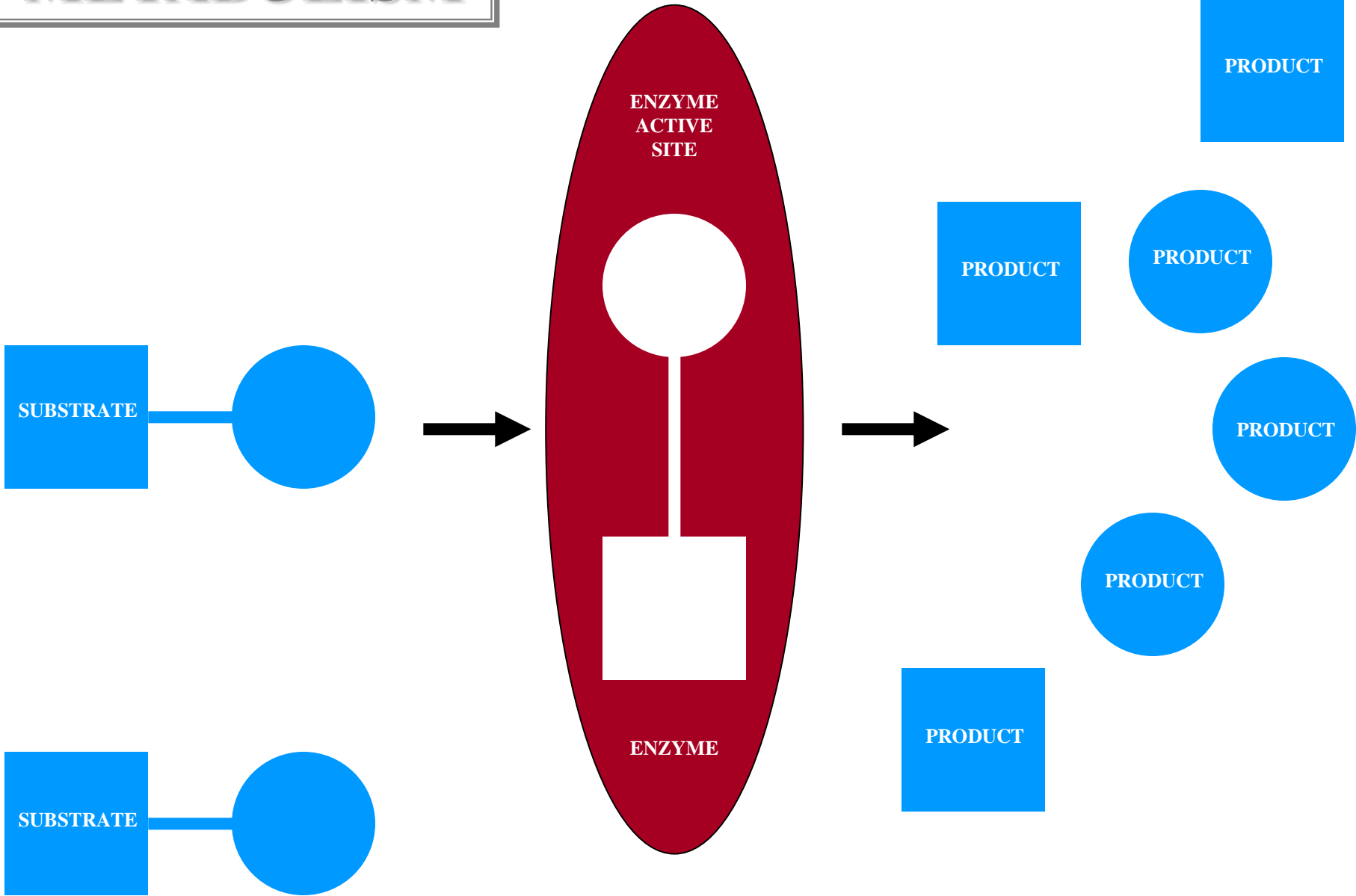
METABOLISM



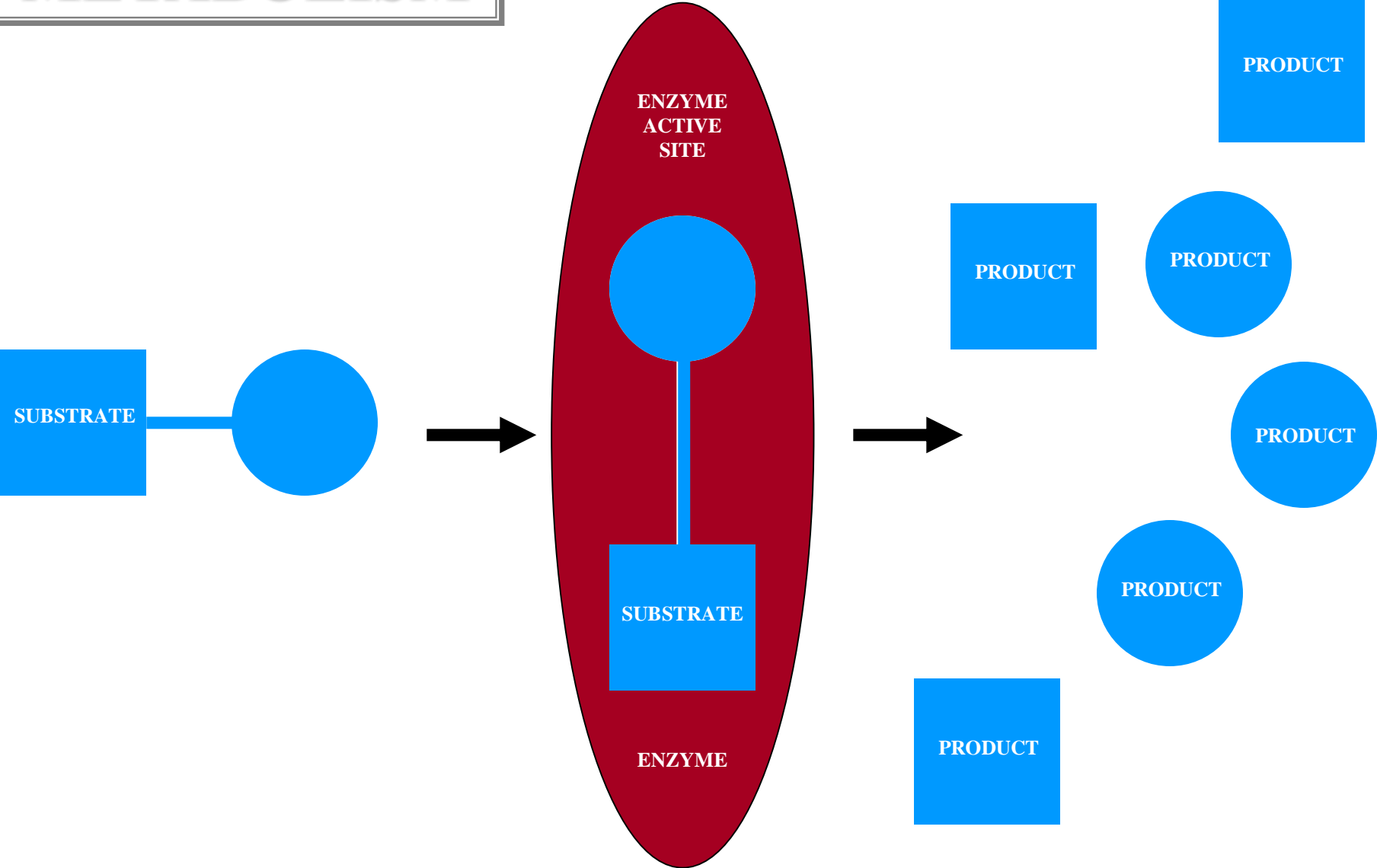
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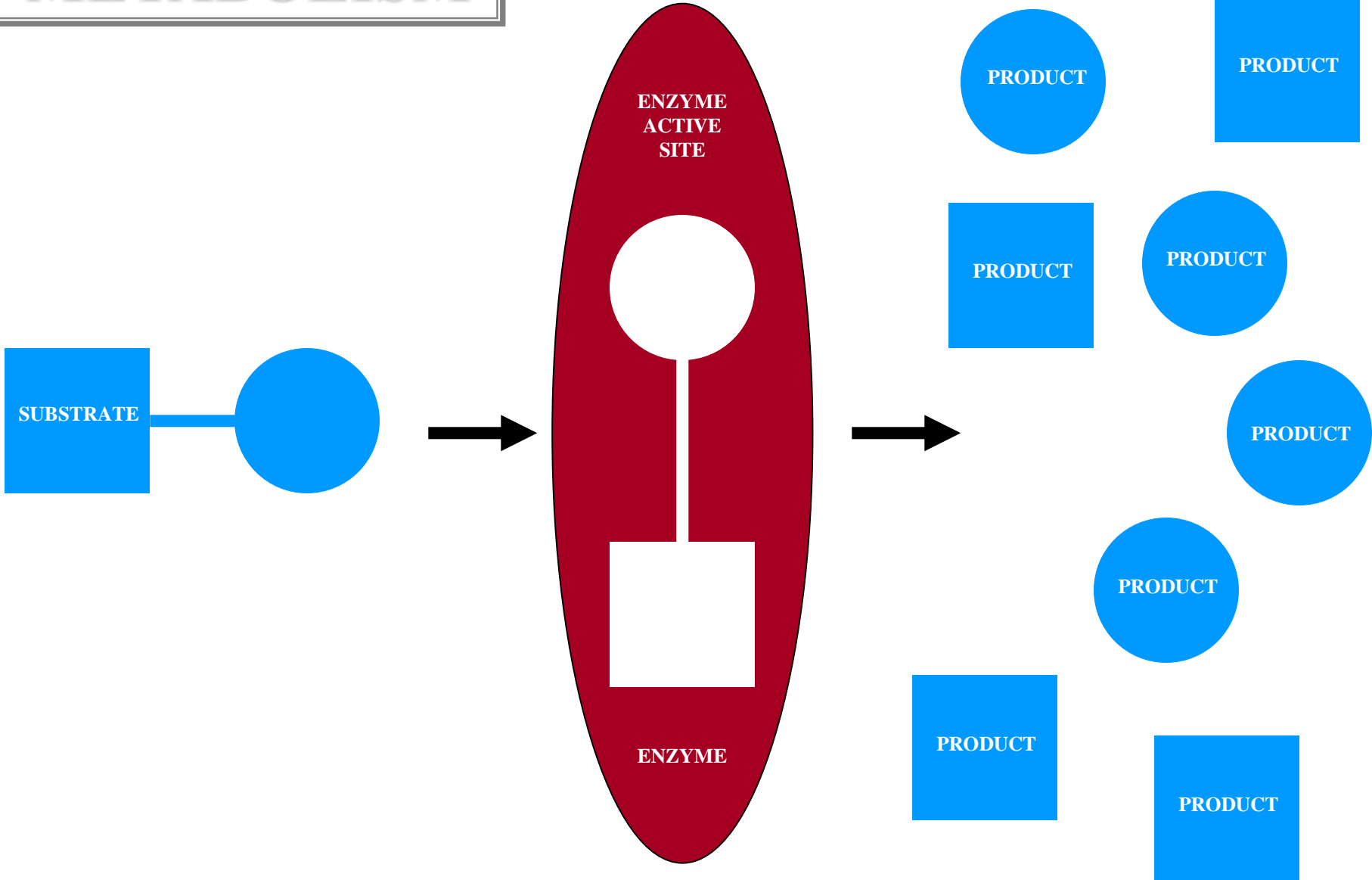
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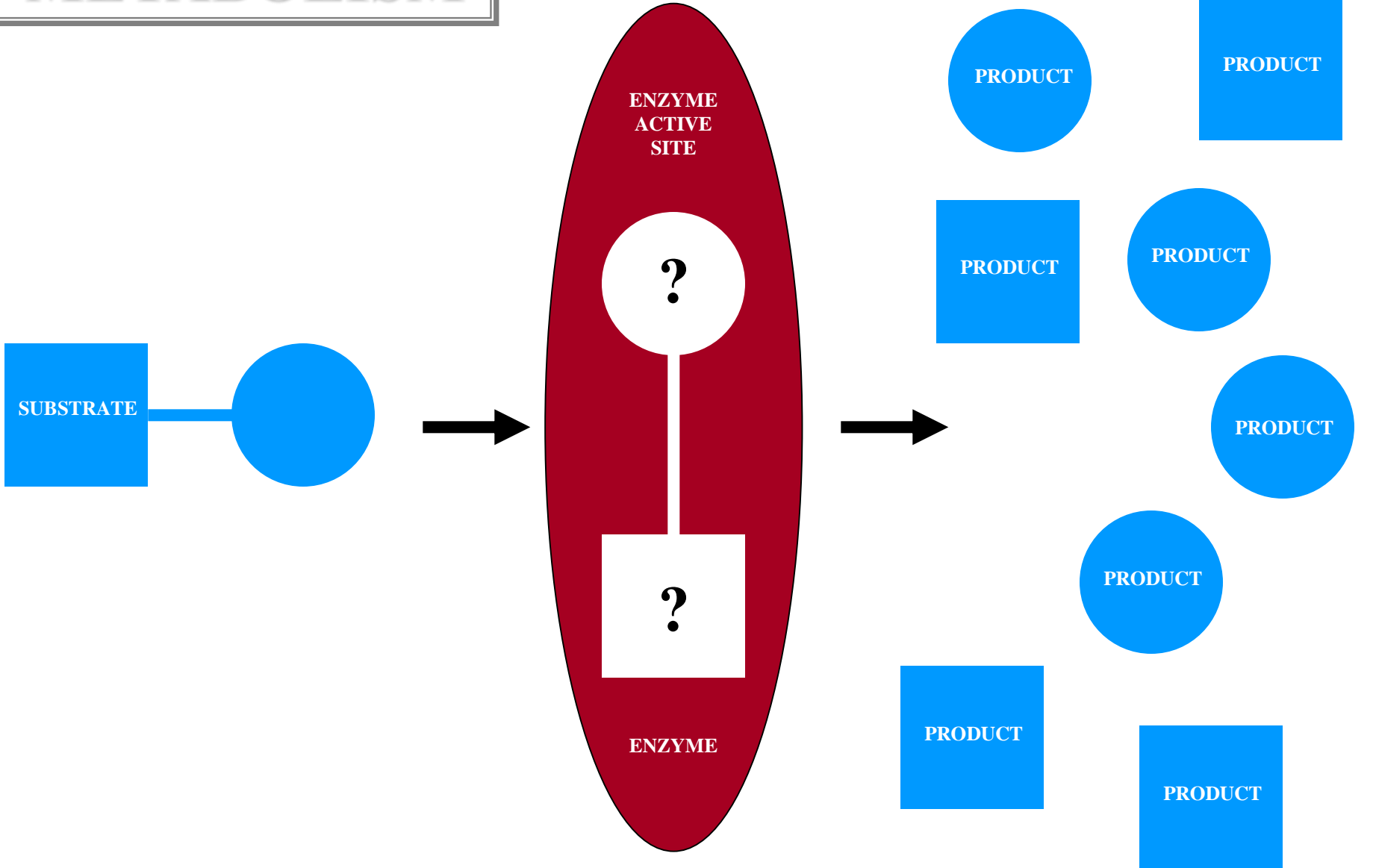
METABOLISM



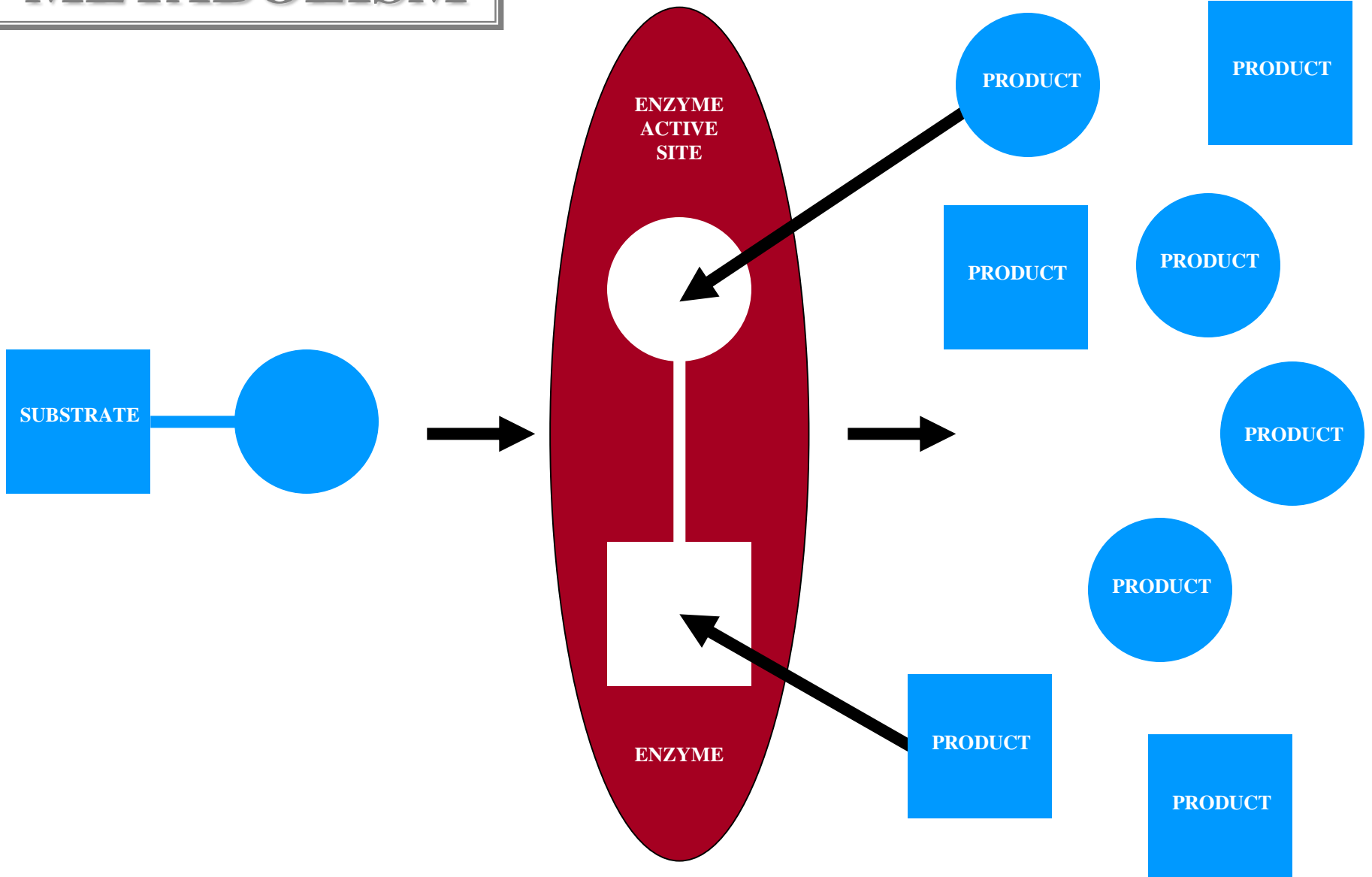
METABOLISM



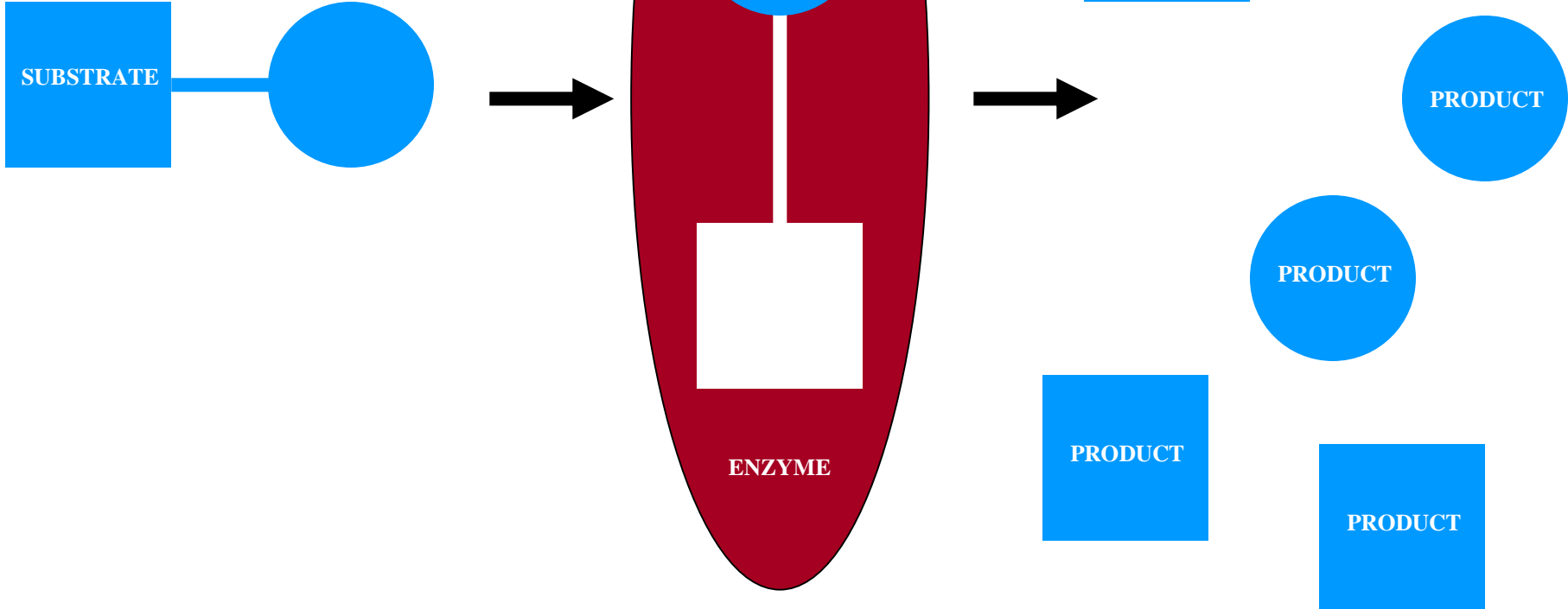
METABOLISM



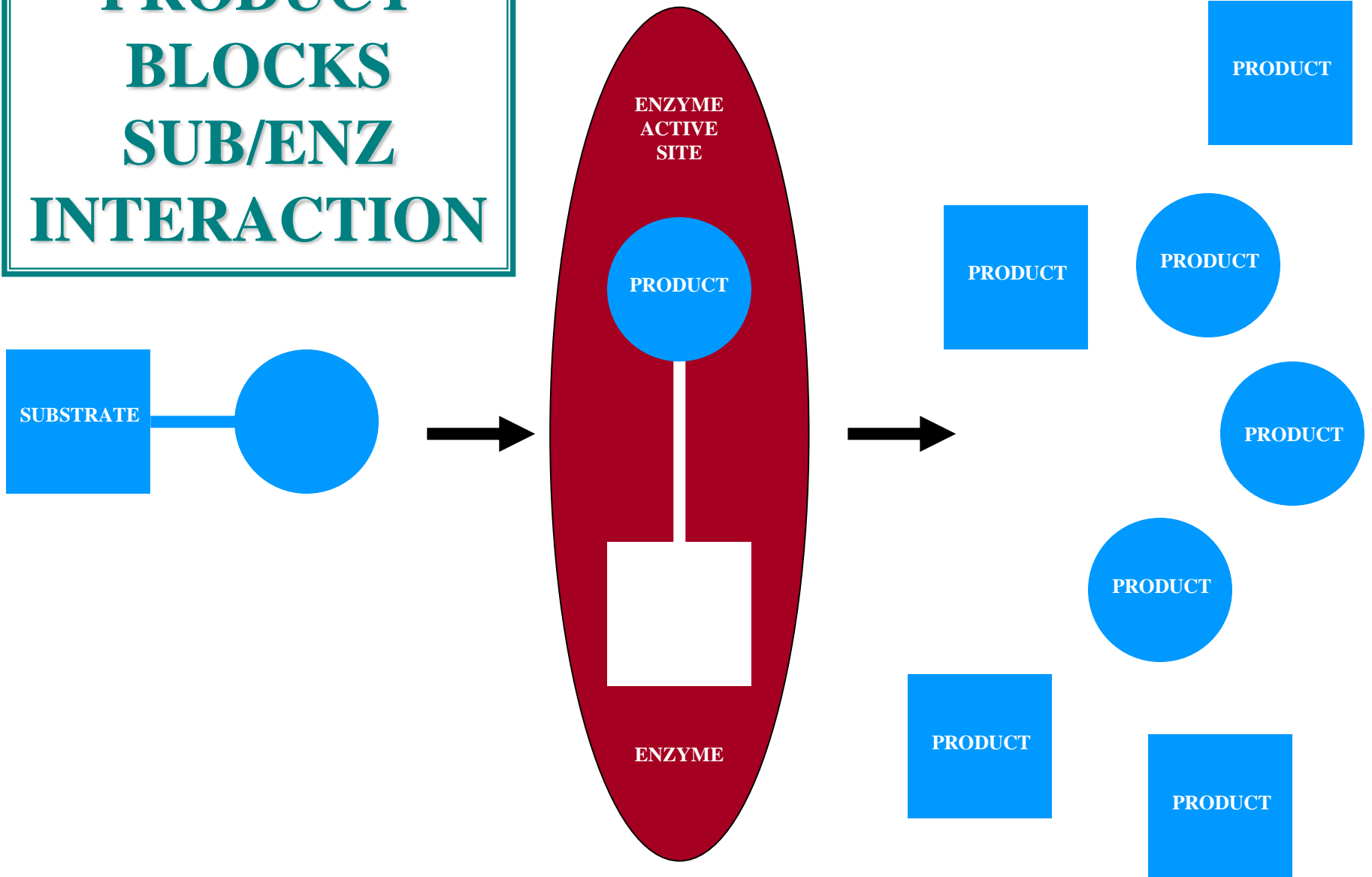
METABOLISM



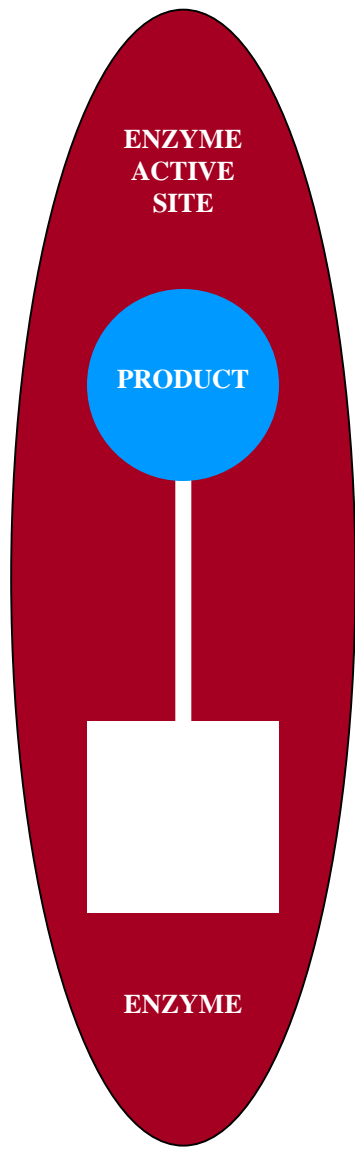
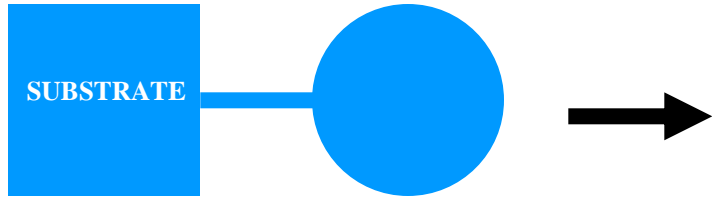
**PRODUCT
OCCUPIES
ENZYME
ACTIVE SITE**



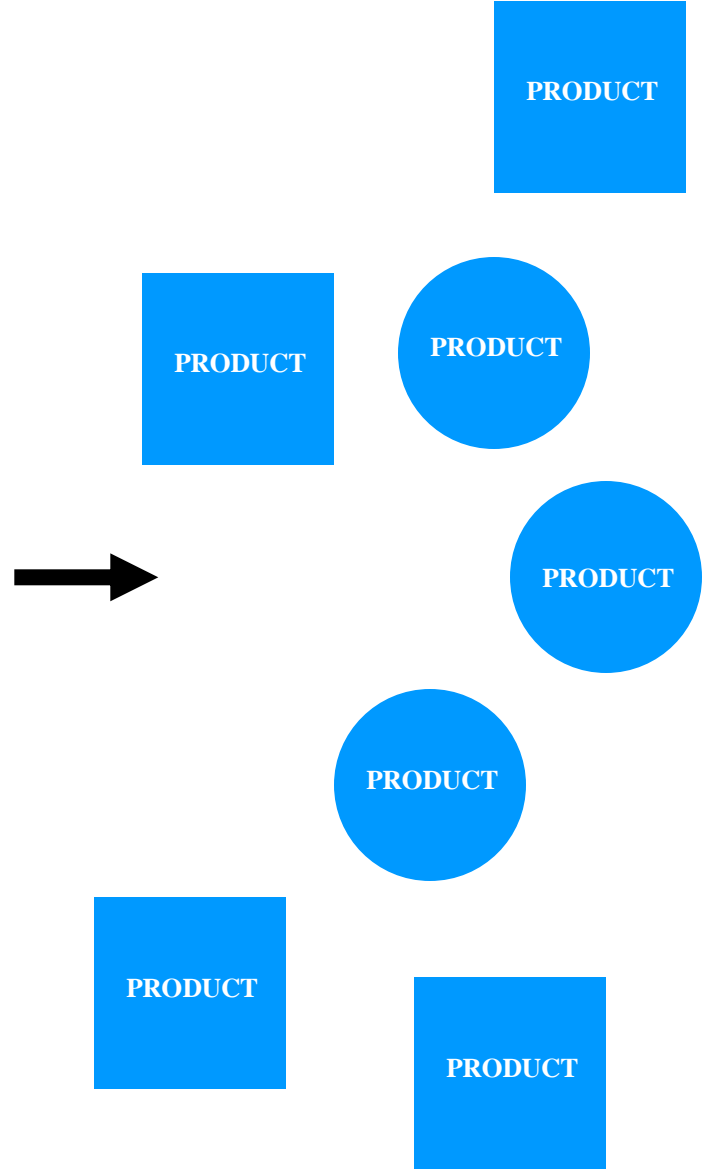
PRODUCT BLOCKS SUB/ENZ INTERACTION



**PRODUCT
BLOCKS
SUB/ENZ
INTERACTION**

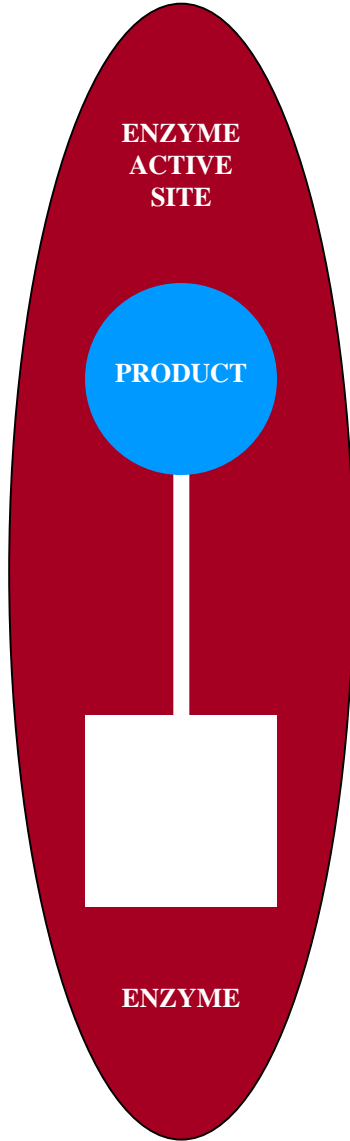
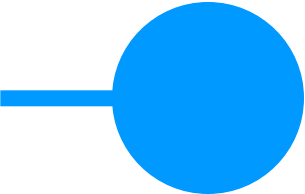


**PRODUCT
ACTS AS
ENZYME
INHIBITOR**



**NO
PRODUCT
OUTPUT**

SUBSTRATE



PRODUCT

PRODUCT

PRODUCT

PRODUCT

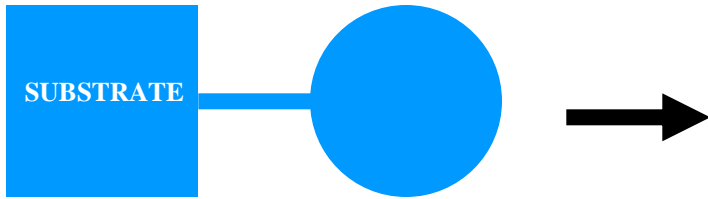
PRODUCT

PRODUCT

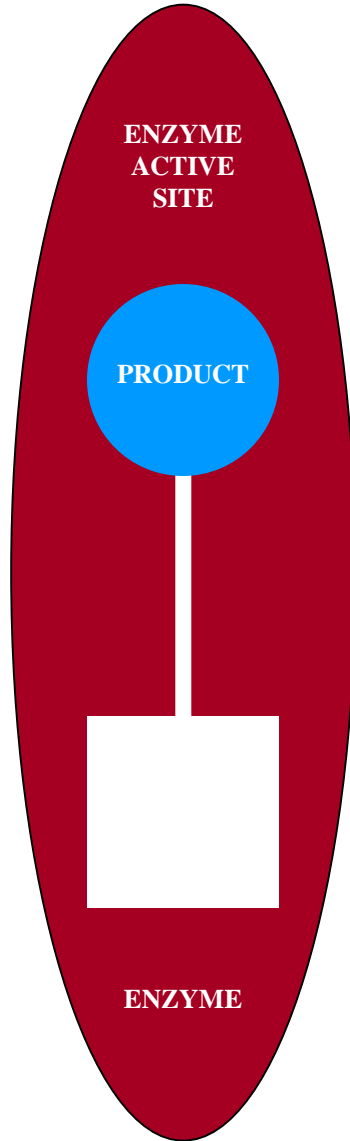
PRODUCT

**PRODUCT
ACTS AS
ENZYME
INHIBITOR**

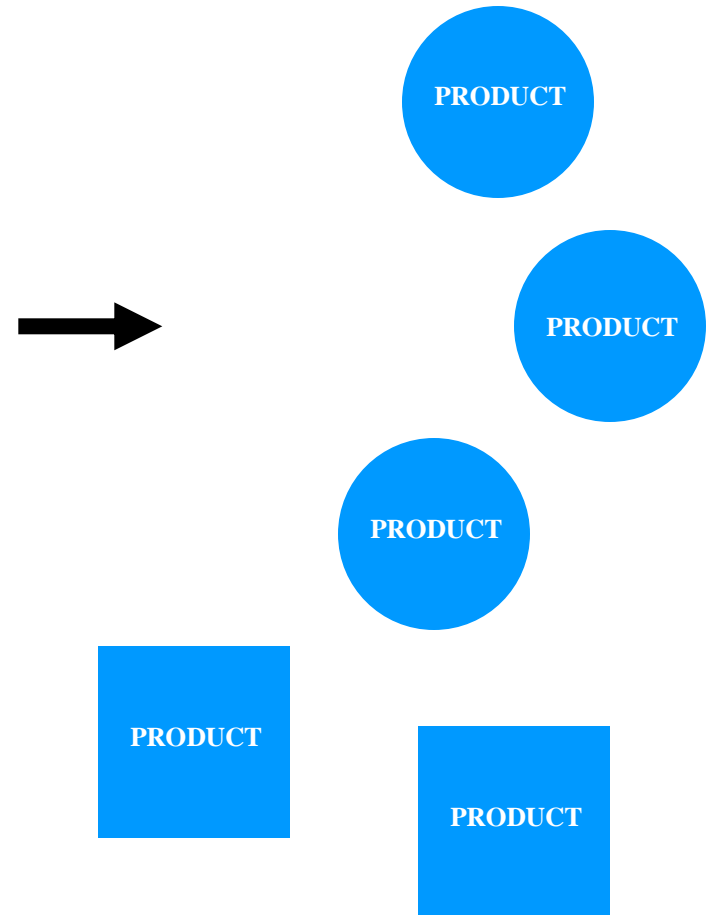
**NO
PRODUCT
OUTPUT**



**PRODUCT
ACTS AS
ENZYME
INHIBITOR**



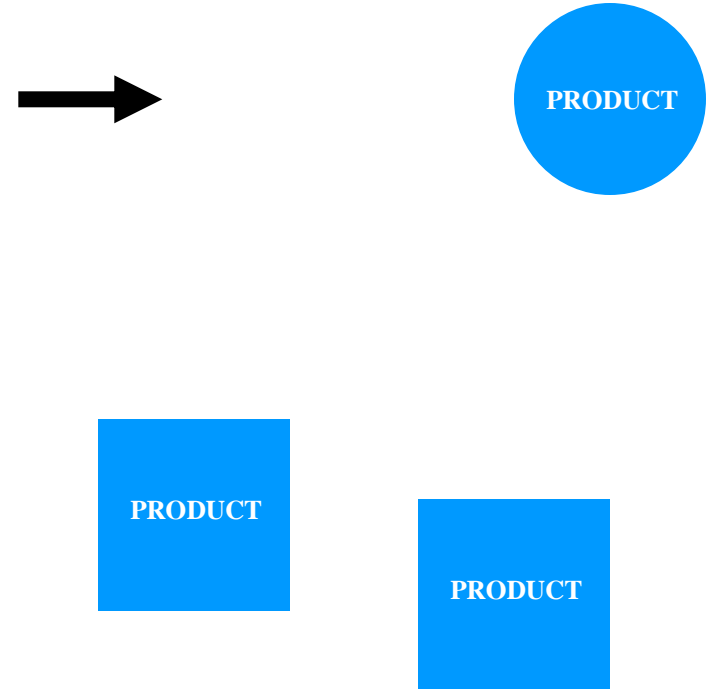
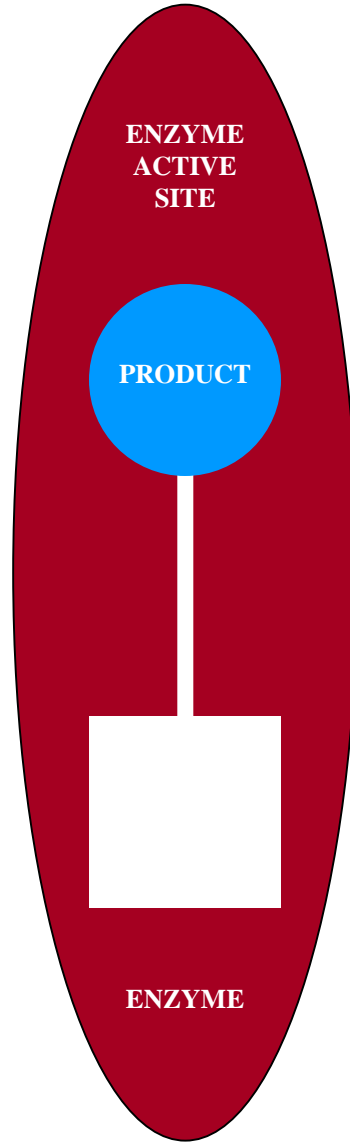
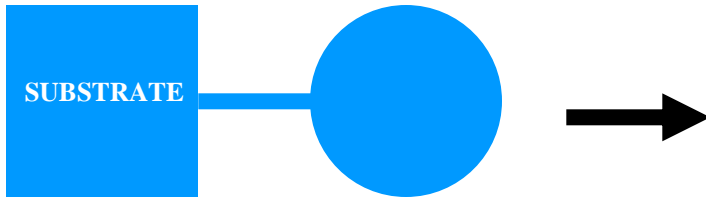
**METABOLISM
CONSUMES PRODUCT**



**NO
PRODUCT
OUTPUT**

**METABOLISM
CONSUMES PRODUCT**

+

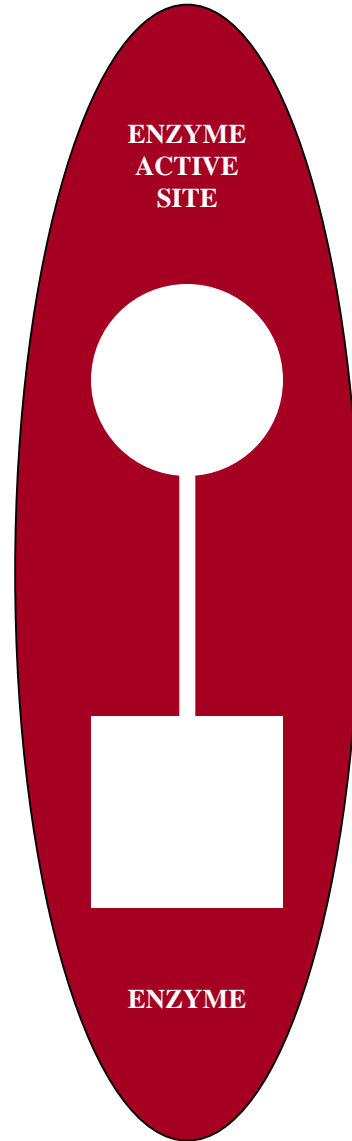
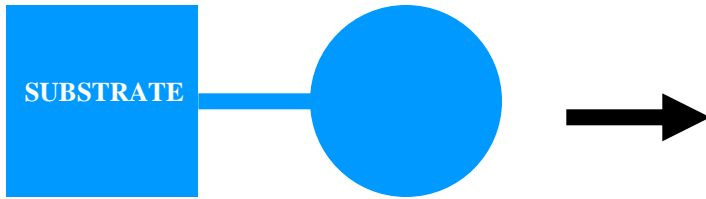


**PRODUCT
ACTS AS
ENZYME
INHIBITOR**

**NO
PRODUCT
OUTPUT**

**METABOLISM
CONSUMES PRODUCT**

EQ



**PRODUCT
ACTS AS
ENZYME
INHIBITOR**

**NO
PRODUCT
OUTPUT**

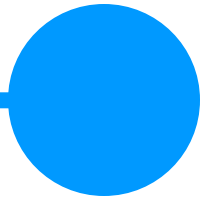
**METABOLISM
CONSUMES PRODUCT**

FB

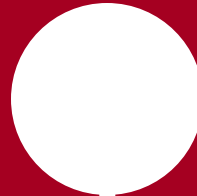
!

+

SUBSTRATE



ENZYME
ACTIVE
SITE



ENZYME



PRODUCT



**PRODUCT
ACTS AS
ENZYME
INHIBITOR**

**FEED-BACK
REGULATION
MAINTAINS
SUBSTRATE
PRODUCT
EQUALIBRIUM**



FEED-BACK REGULATION



***ENSURES
METABOLIC
EQUALIBRIUM***

***EFFICIENT
CELL
METABOLISM***

An electron micrograph showing a cross-section of a cell. A large, centrally located nucleus is visible, containing a prominent nucleolus and dense chromatin. Surrounding the nucleus are numerous mitochondria, characterized by their elongated, tubular shape and internal cristae. The cytoplasm is filled with various organelles and a network of membranes.

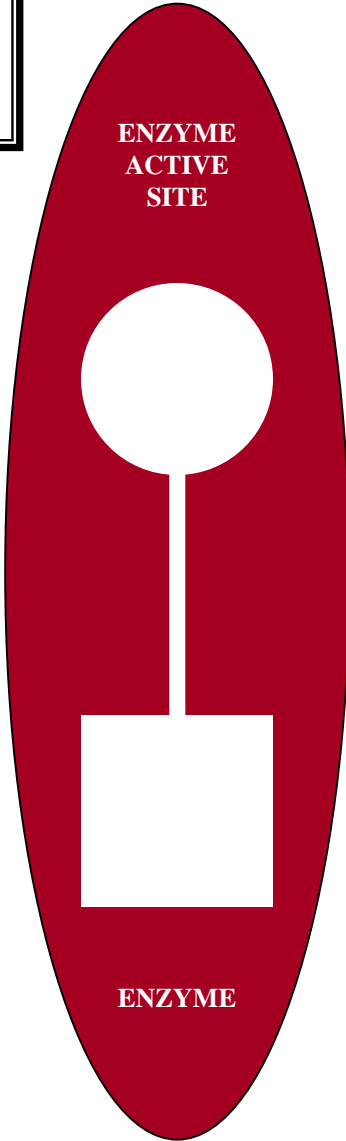
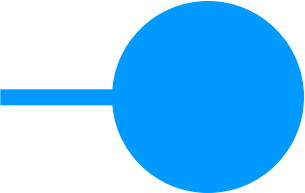
FB

?

HOMEOSTASIS

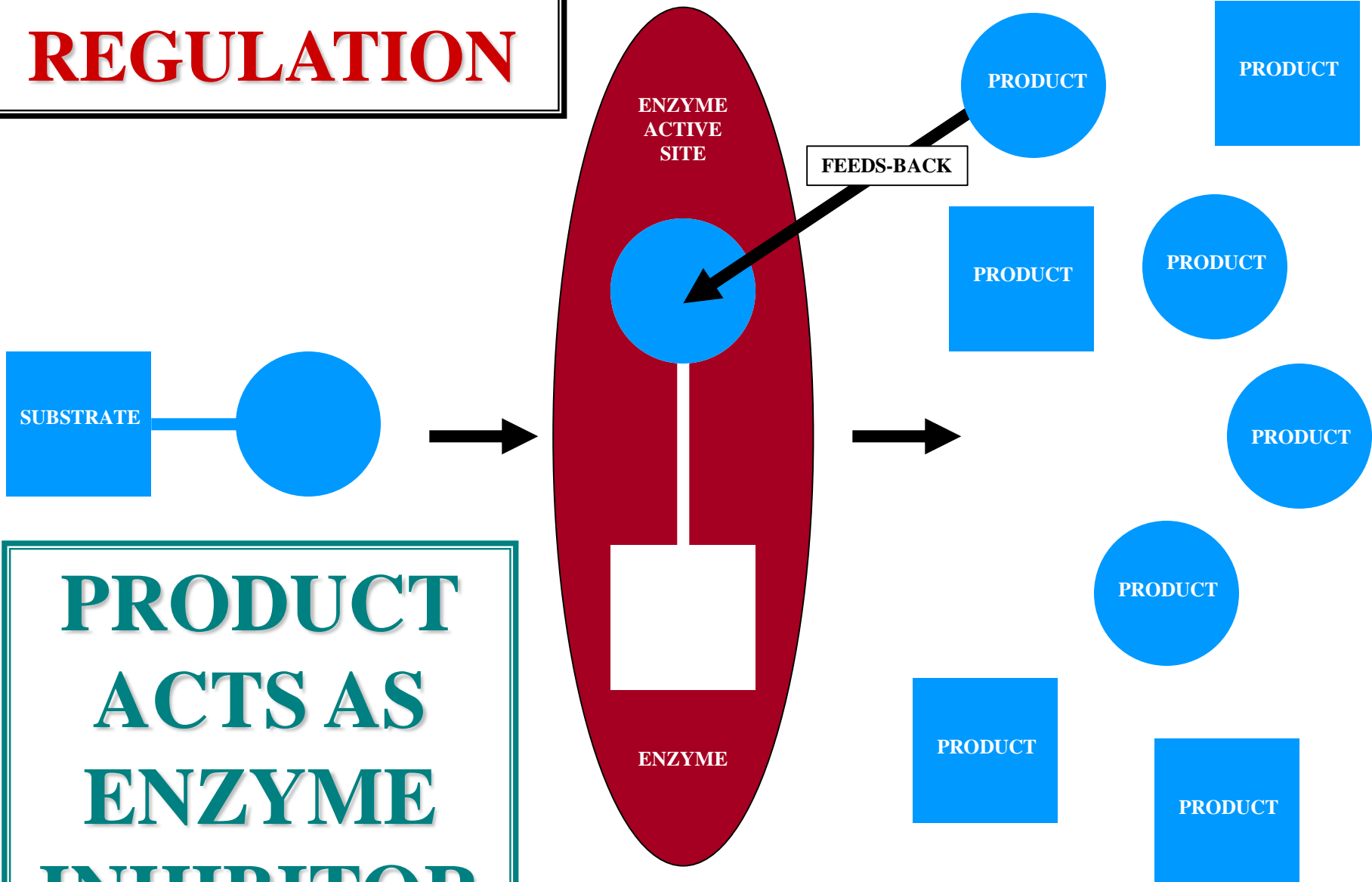
?
REGULATION

SUBSTRATE



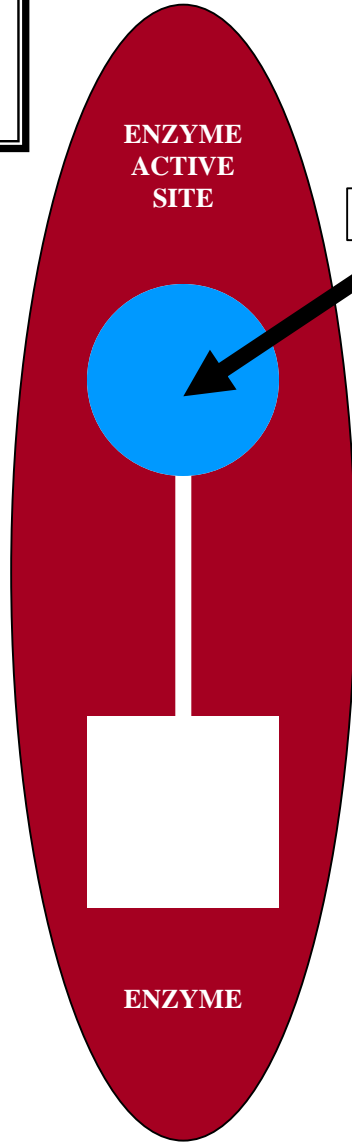
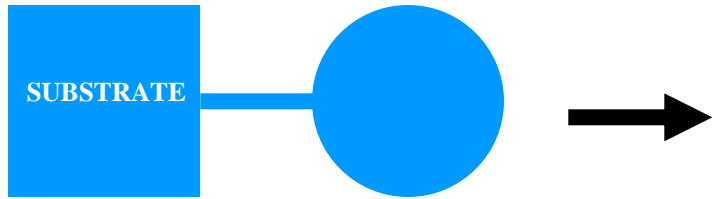
**PRODUCT
ACTS AS
ENZYME
INHIBITOR**

**?
REGULATION**

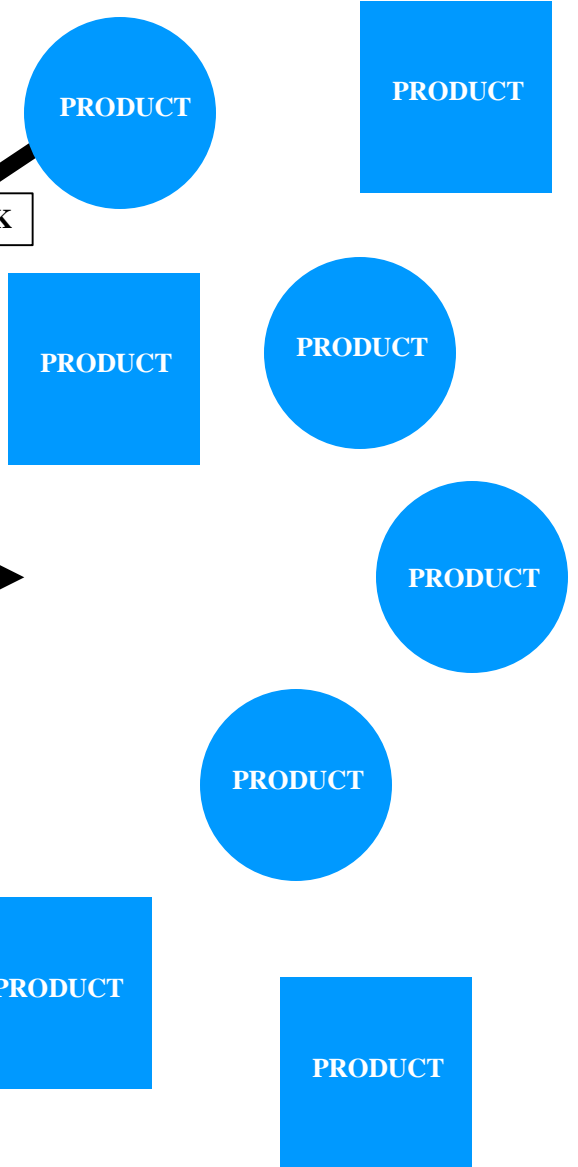
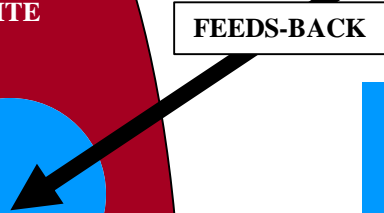


**PRODUCT
ACTS AS
ENZYME
INHIBITOR**

FEED-BACK REGULATION

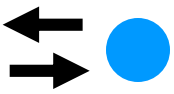
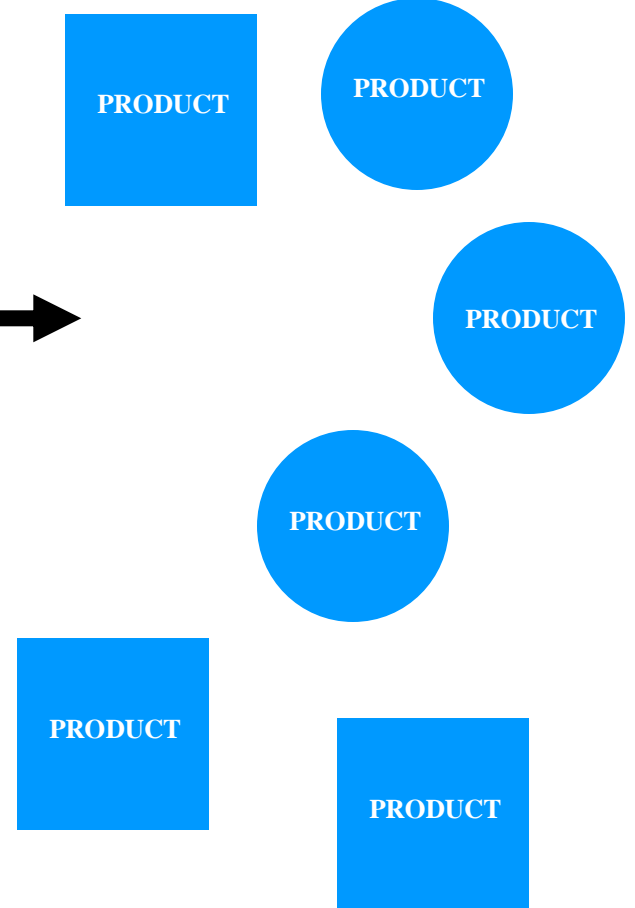
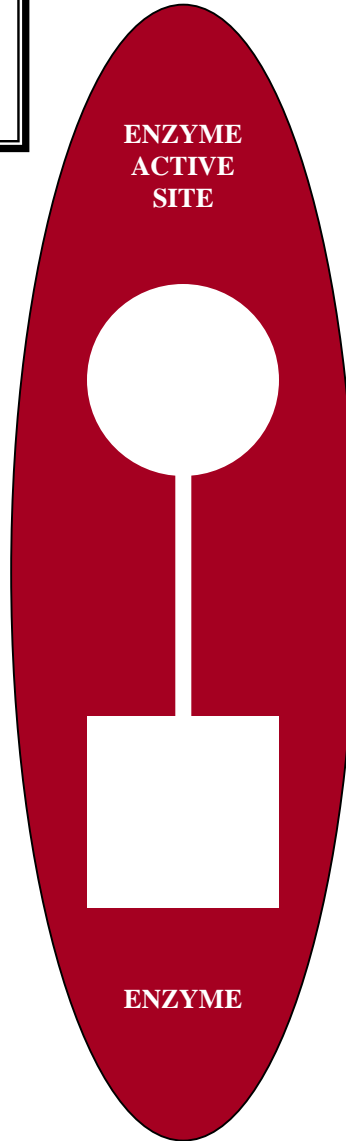
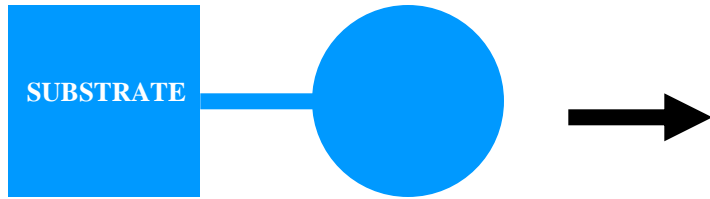


FEEDS-BACK



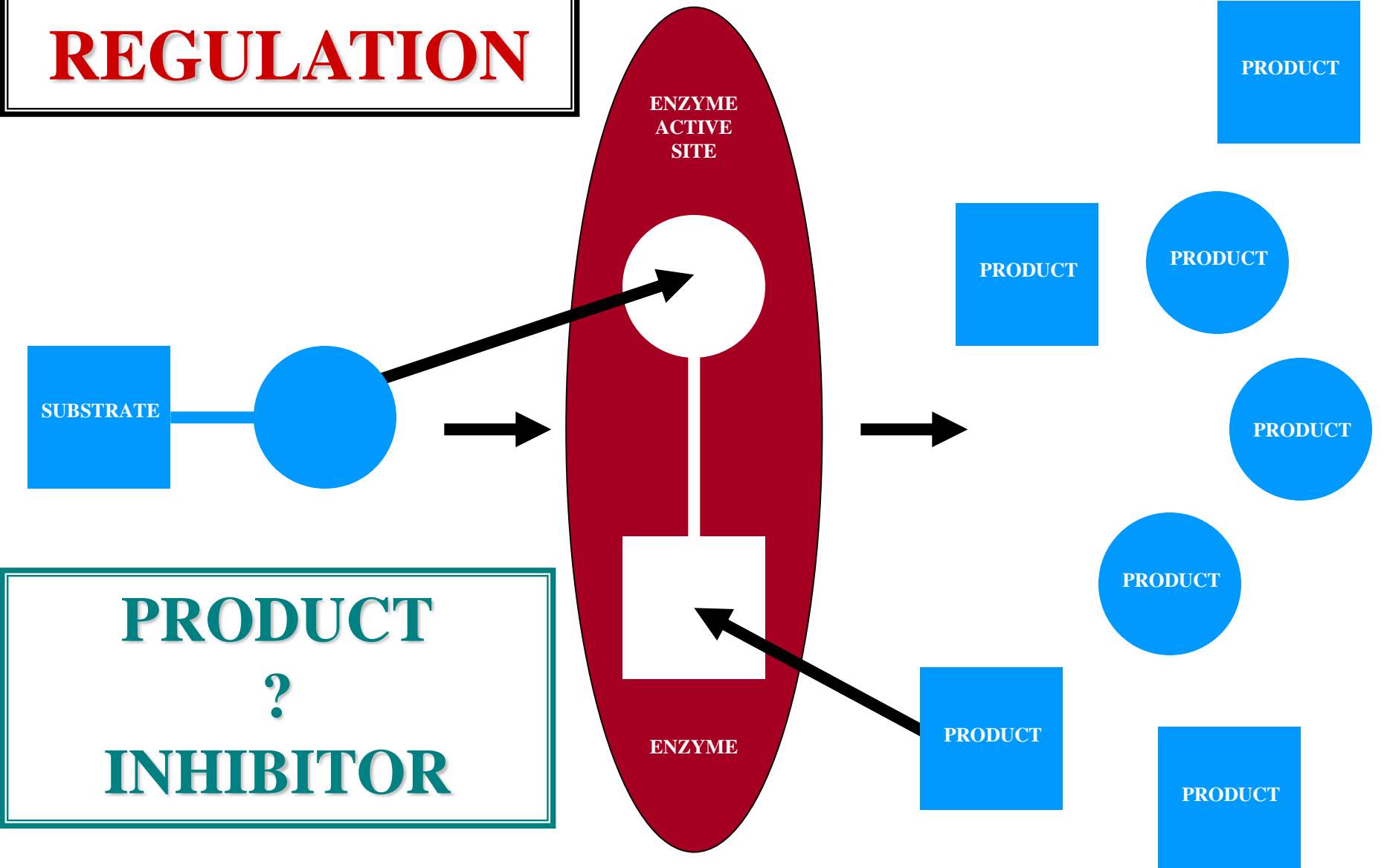
**PRODUCT
ACTS AS
ENZYME
INHIBITOR**

FEED-BACK REGULATION



**PRODUCT
?
INHIBITOR**

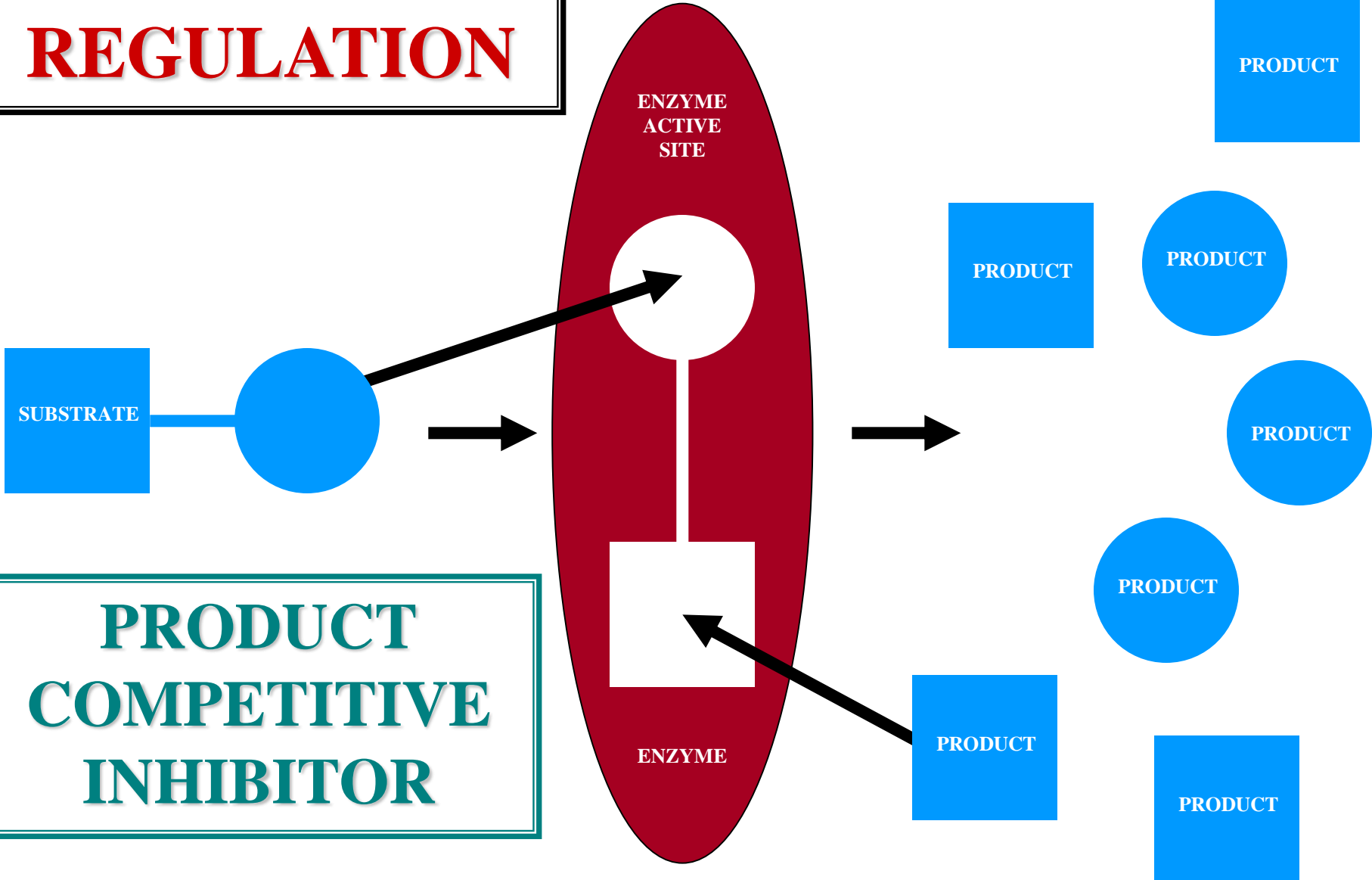
FEED-BACK REGULATION



PRODUCT
?
INHIBITOR



FEED-BACK REGULATION



PRODUCT COMPETITIVE INHIBITOR

**ENDERGONIC
REACTIONS
VS
EXERGONIC
REACTIONS**

ENDERGONIC REACTION

ENDERGONIC REACTION

**REQUIRES
ENERGY INPUT**

ENDERGONIC REACTION

EXERGONIC REACTION

EXERGONIC REACTION

RELEASES ENERGY

EXERGONIC REACTION

**ENDERGONIC
REACTIONS
VS
EXERGONIC
REACTIONS
APPLIED**



**ENDERGONIC
REACTIONS VS**

**EXERGONIC
REACTIONS**



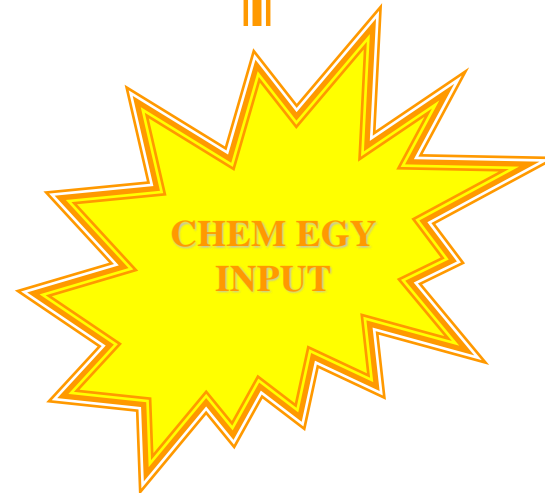
BIOCHEMICAL REACTION

ENDERGONIC REACTIONS VS EXERGONIC REACTIONS



?

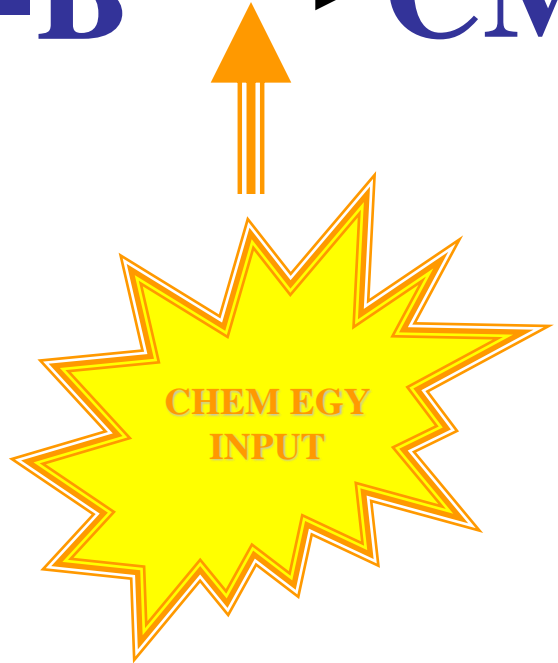
REACTION



ENDERGONIC REACTIONS VS EXERGONIC REACTIONS



ENDERGONIC REACTION



ENDERGONIC REACTIONS VS EXERGONIC REACTIONS



BIOCHEMICAL REACTION

ENDERGONIC REACTIONS VS EXERGONIC REACTIONS



?
REACTION





ENDERGONIC REACTIONS VS

EXERGONIC REACTIONS



**EXERGONIC
REACTION**





**ENDERGONIC
REACTIONS
&
EXERGONIC
REACTIONS
...
SUMMARY**

**ENDERGONIC
REACTIONS
&
EXERGONIC
REACTIONS
?**



**ENDERGONIC
REACTIONS**

&

**EXERGONIC
REACTIONS**

!!!*INVERSE*!!!



ENDERGONIC

REACTION

REQUIRES ENERGY

&

EXERGONIC

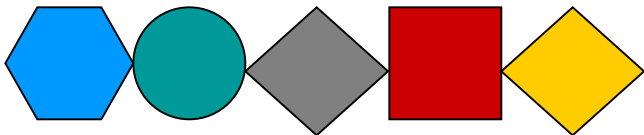
REACTION

RELEASES ENERGY

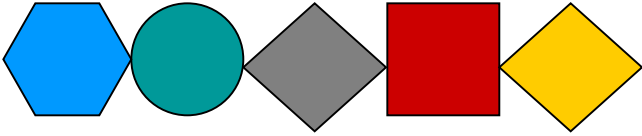
**CATABOLIC
METABOLISM
&
ANABOLIC
METABOLISM
SUMMARY**



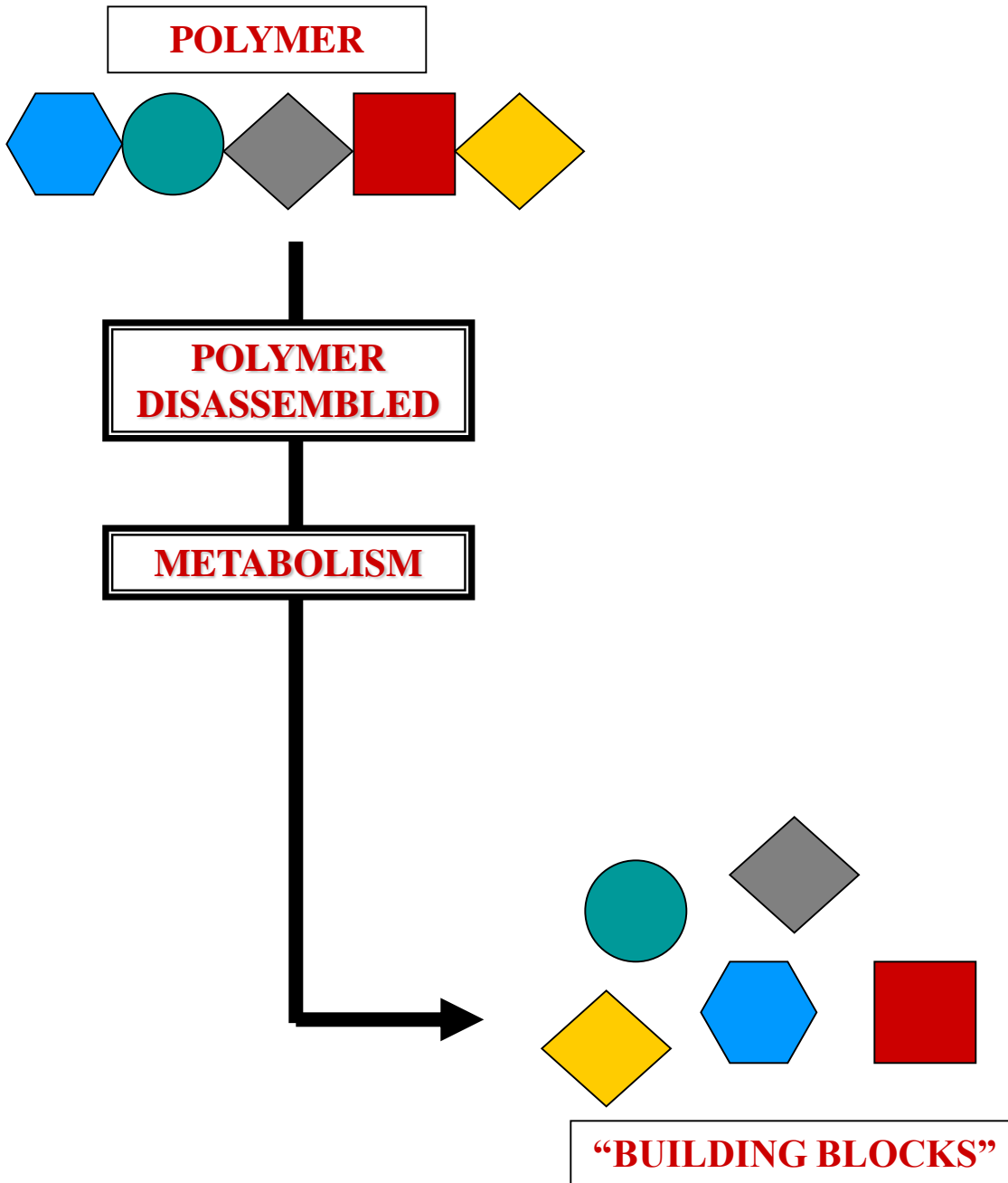
POLYMER

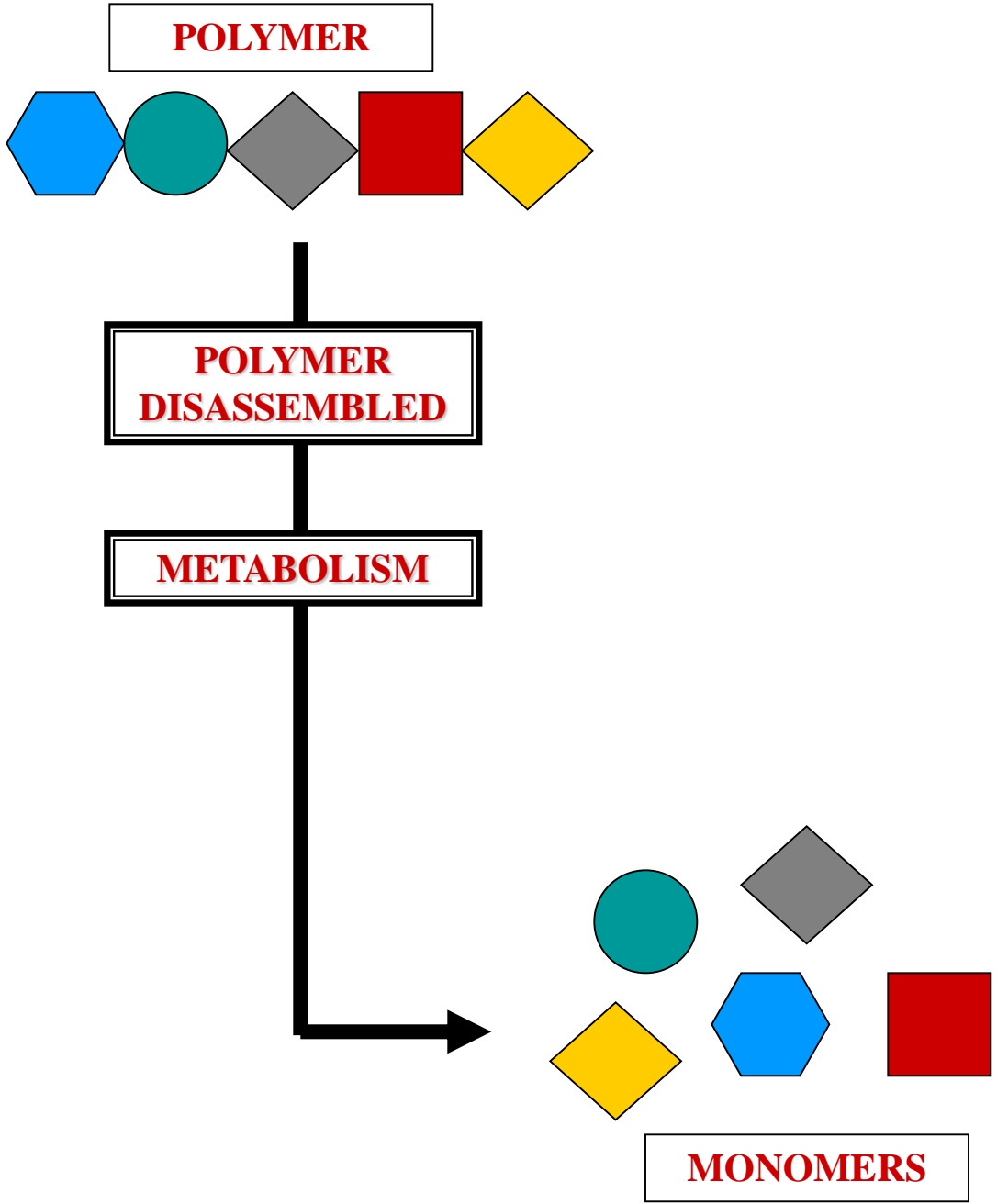


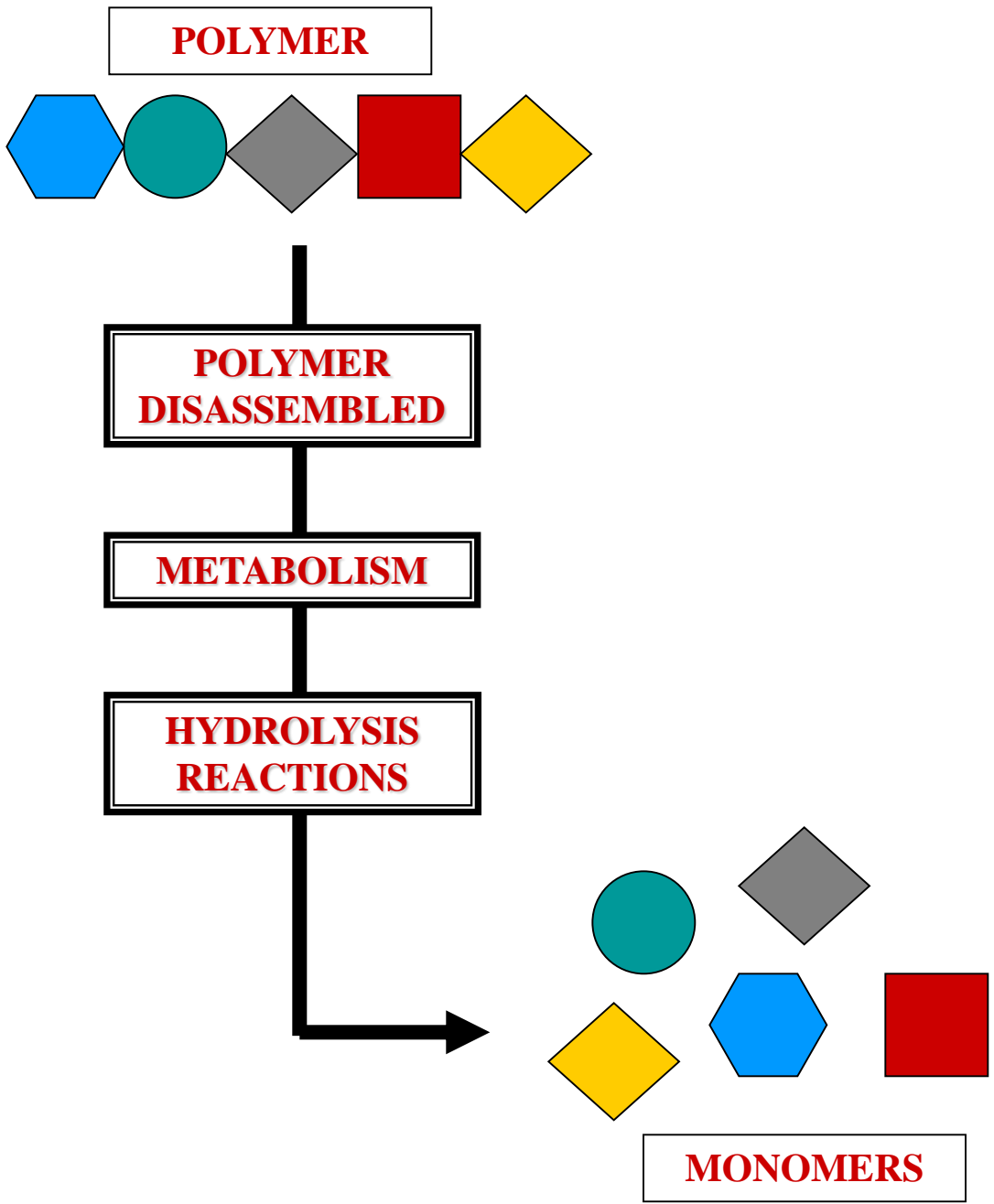
POLYMER

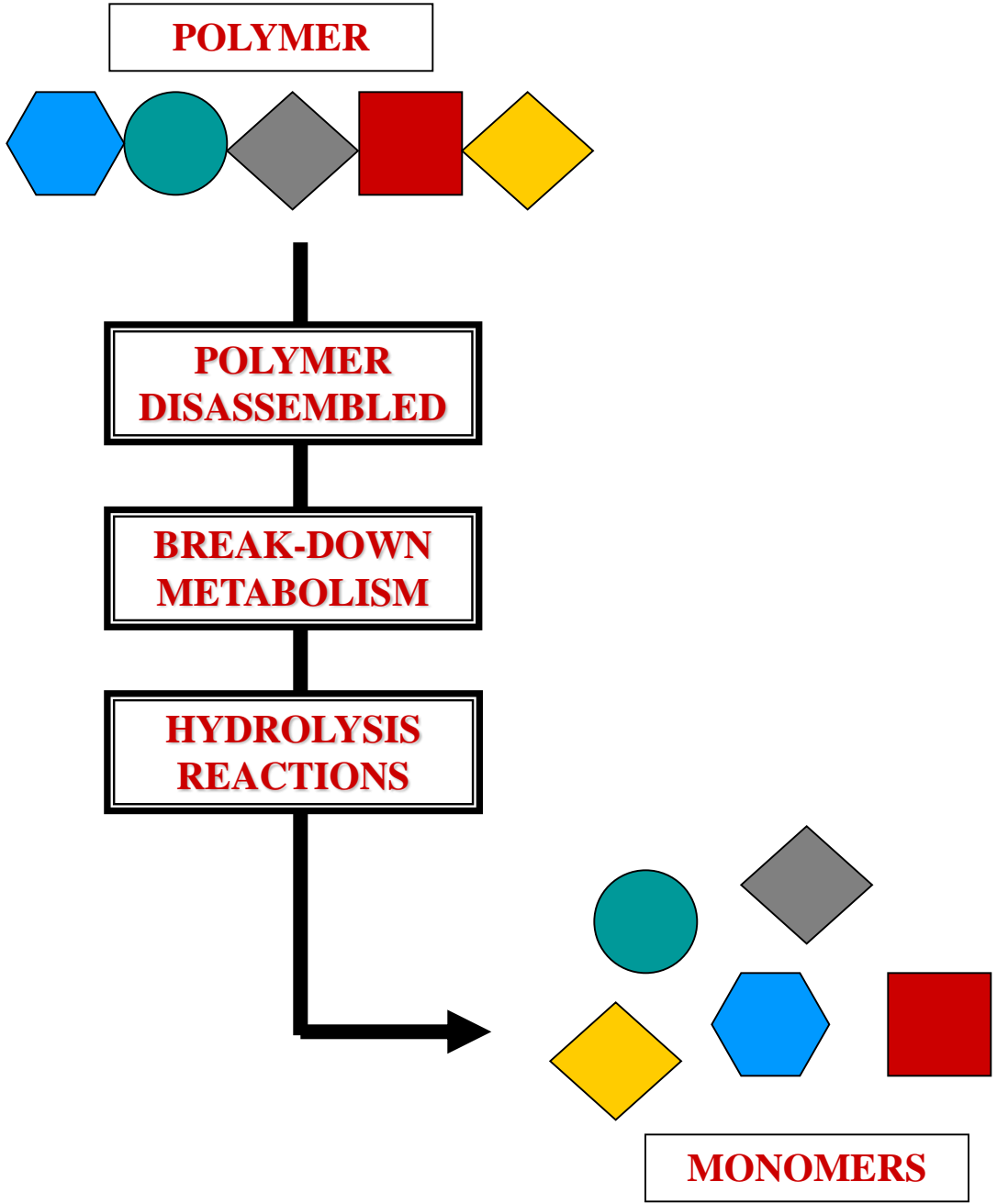


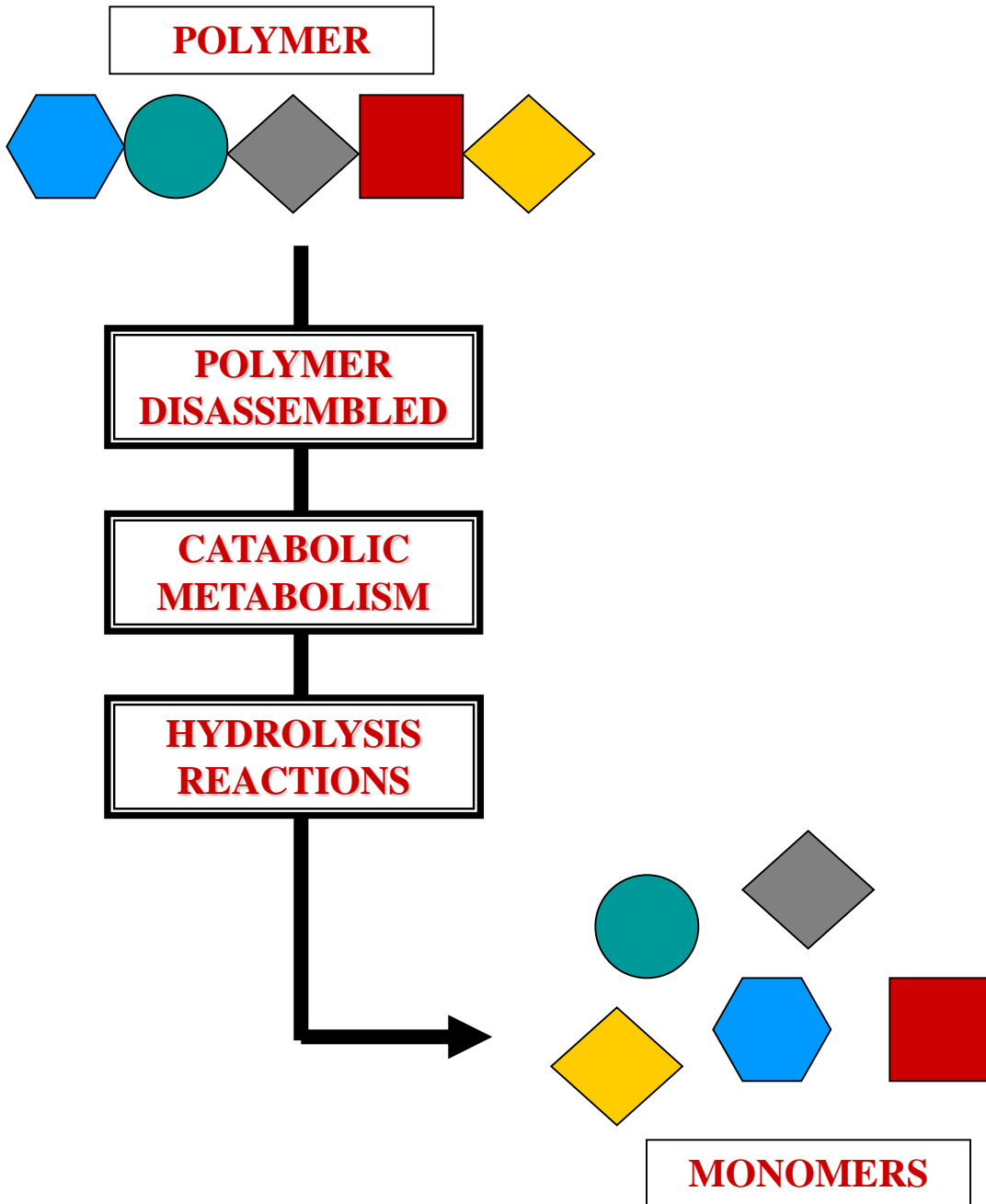
METABOLISM

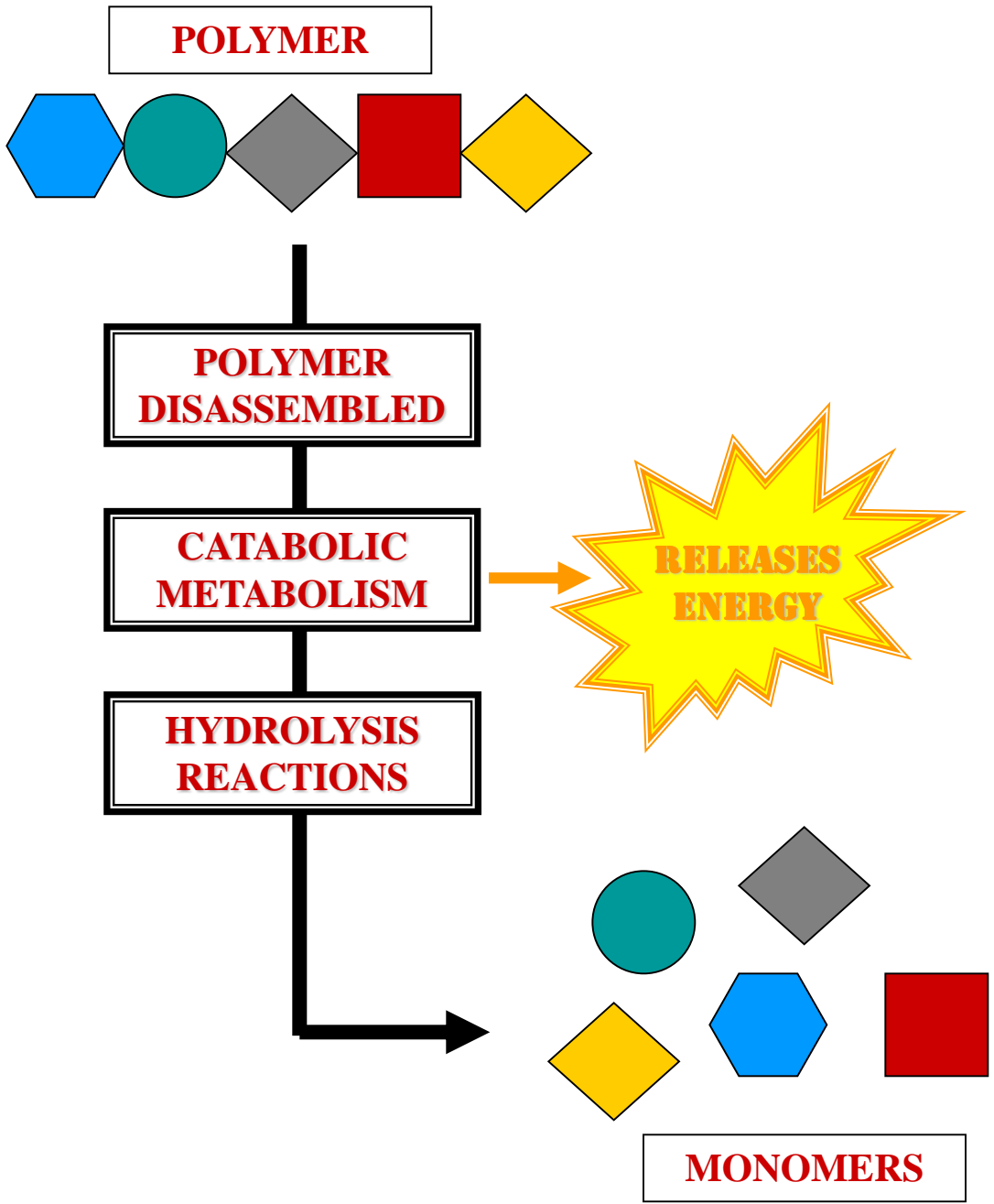


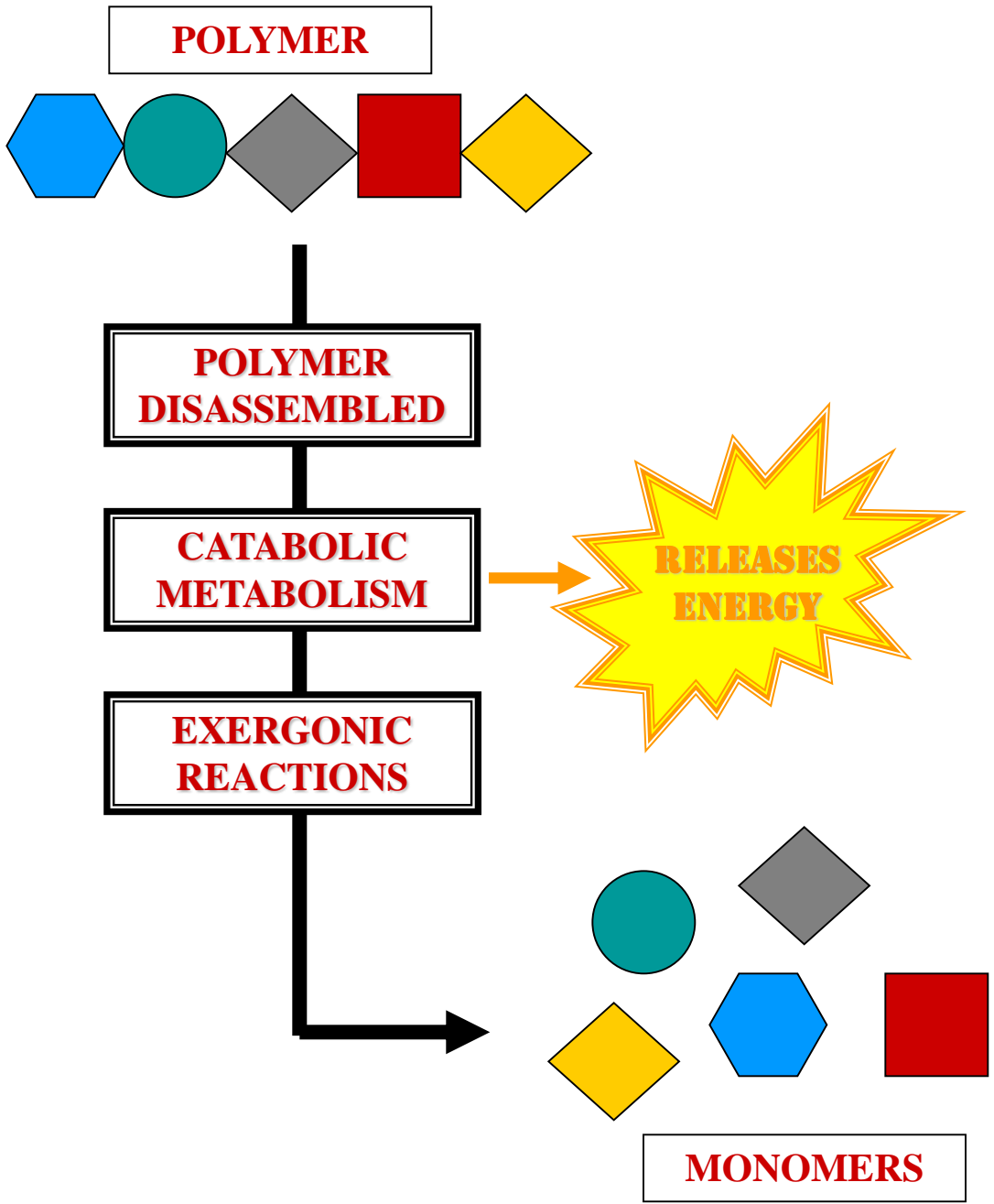


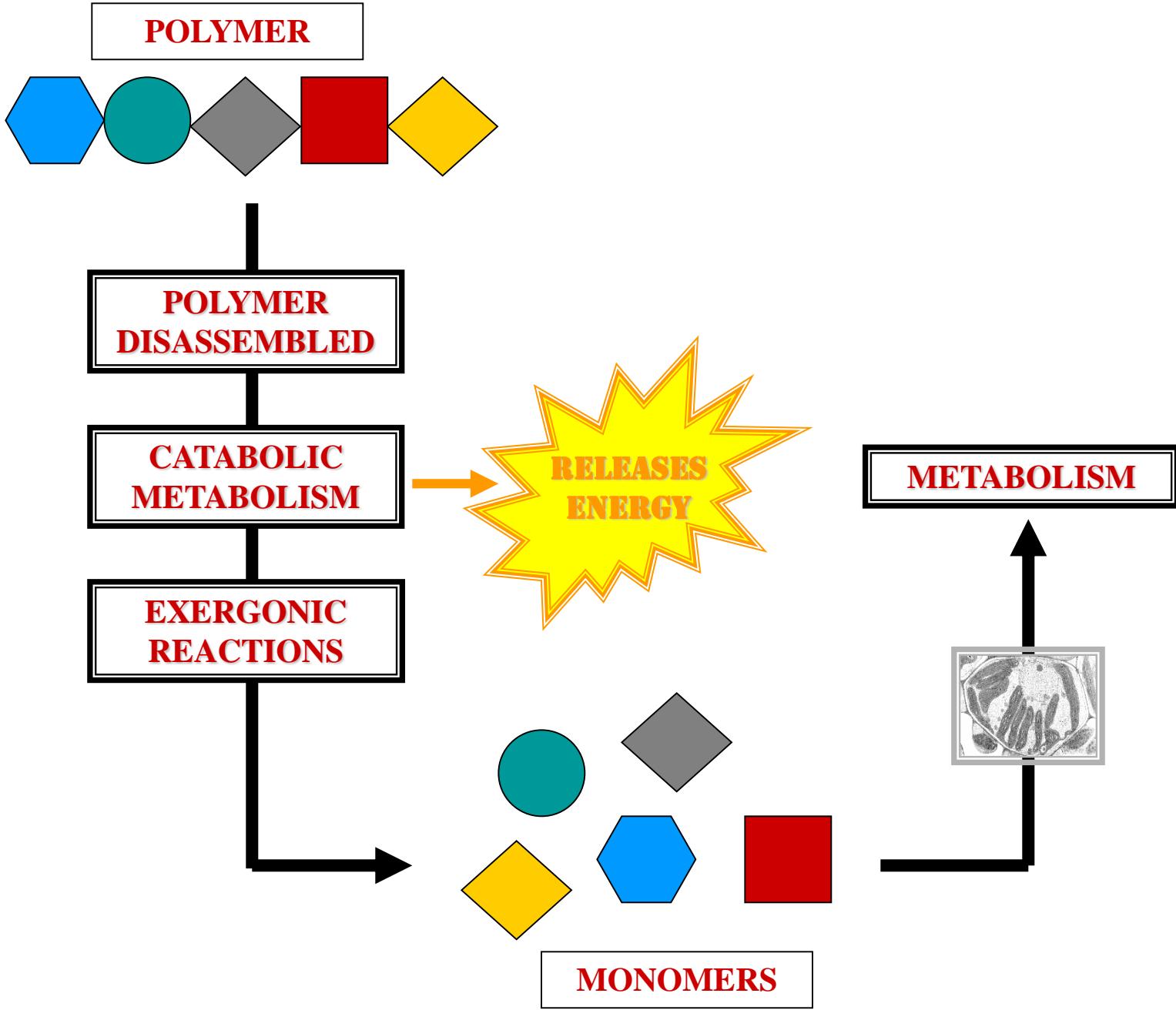


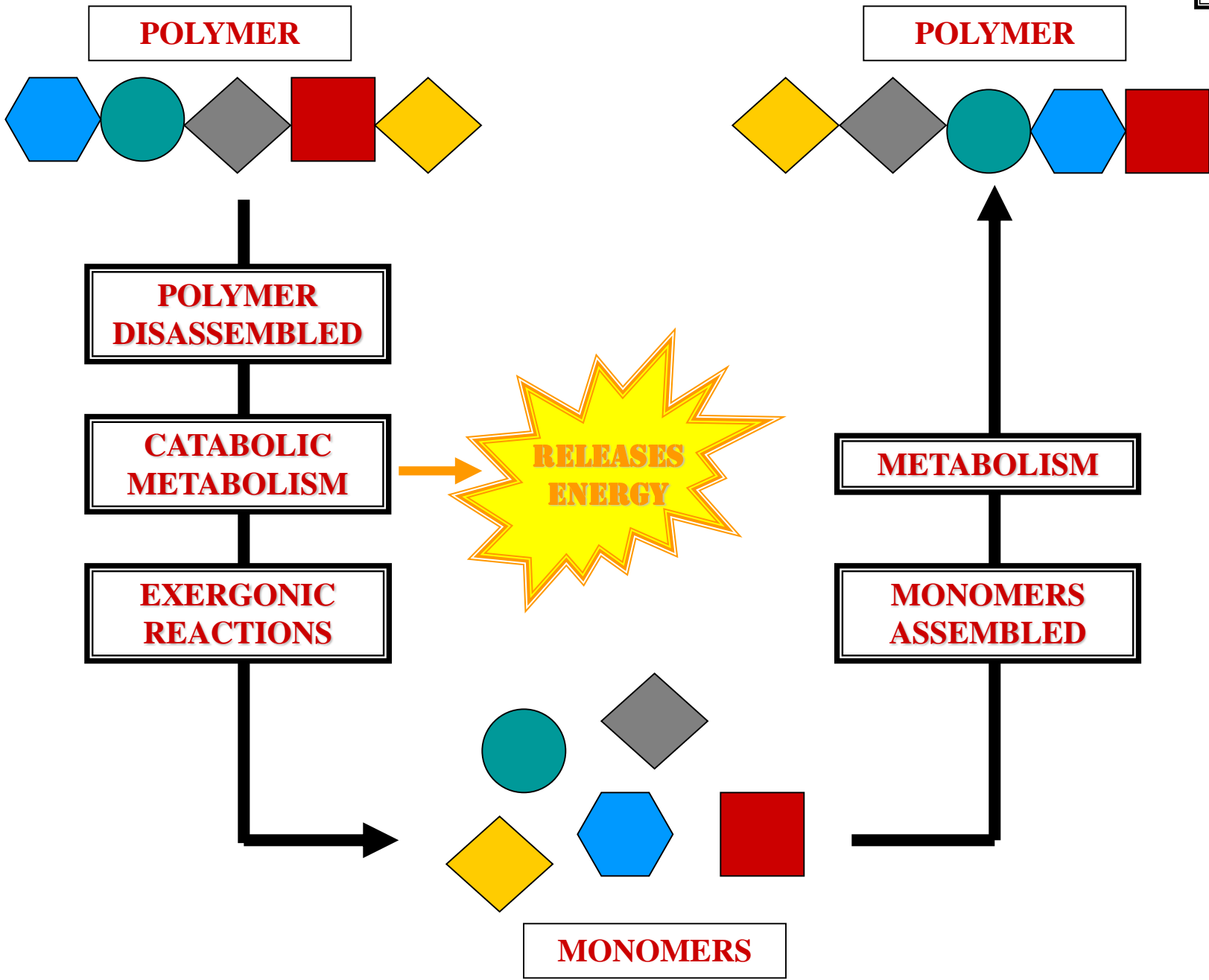


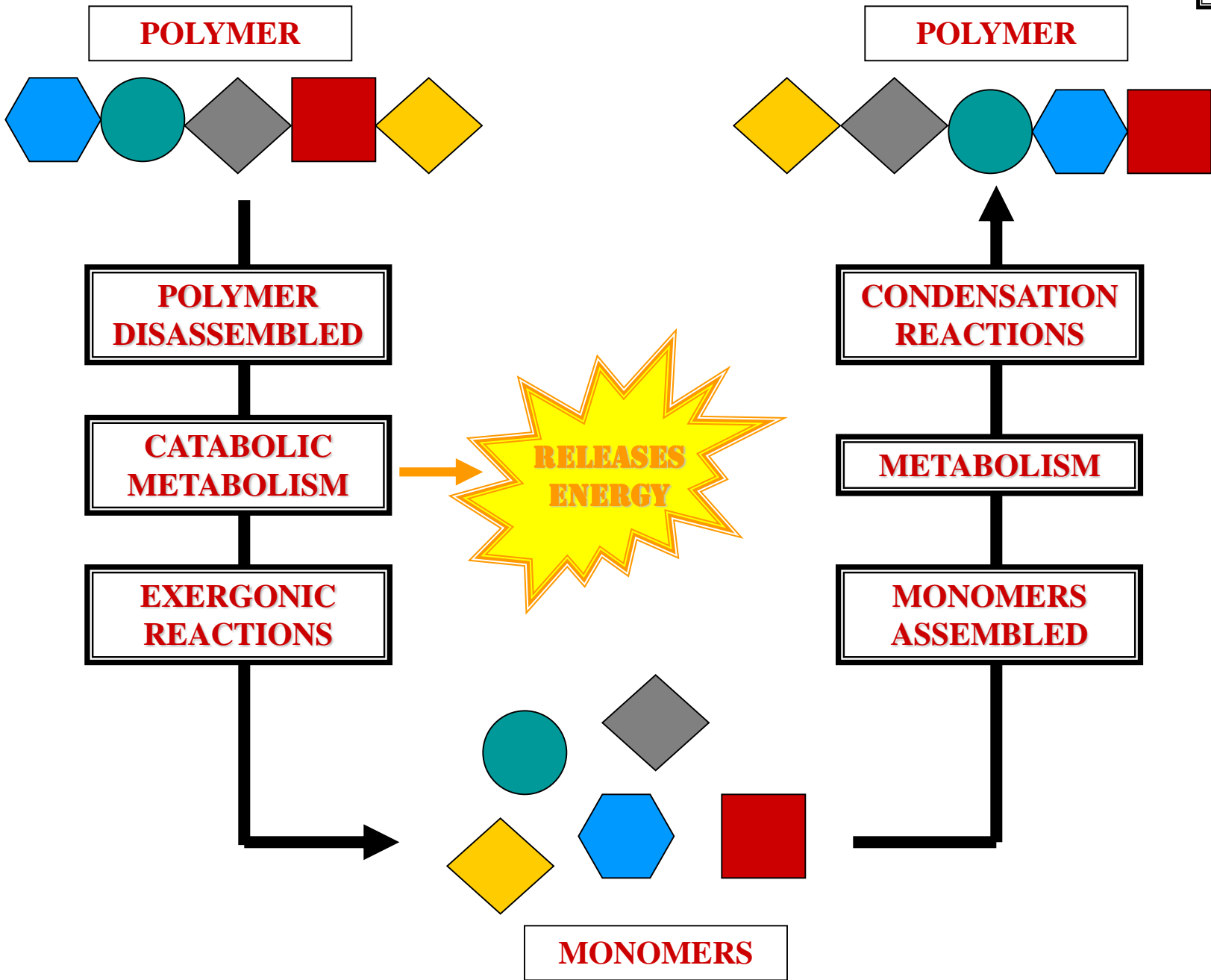


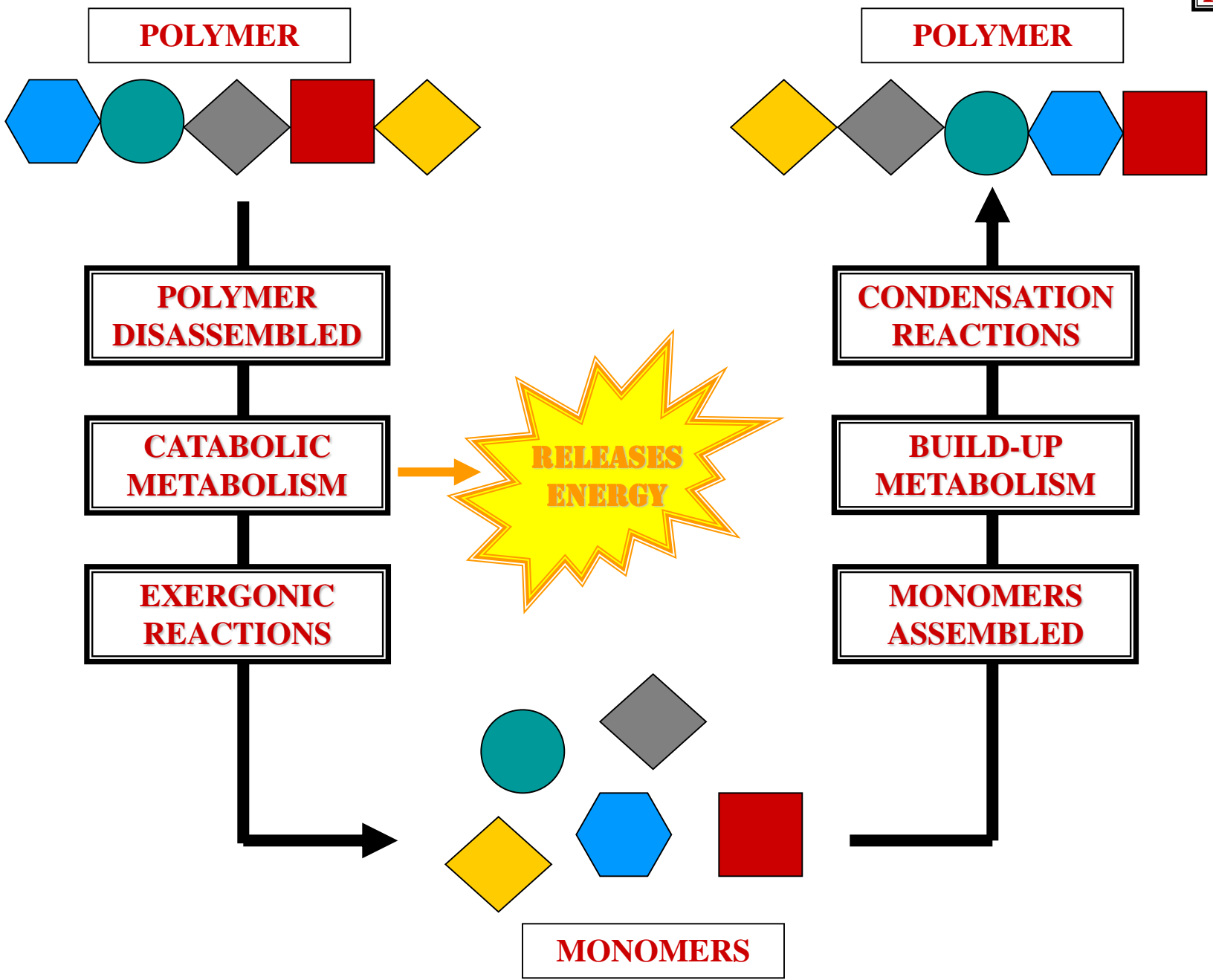


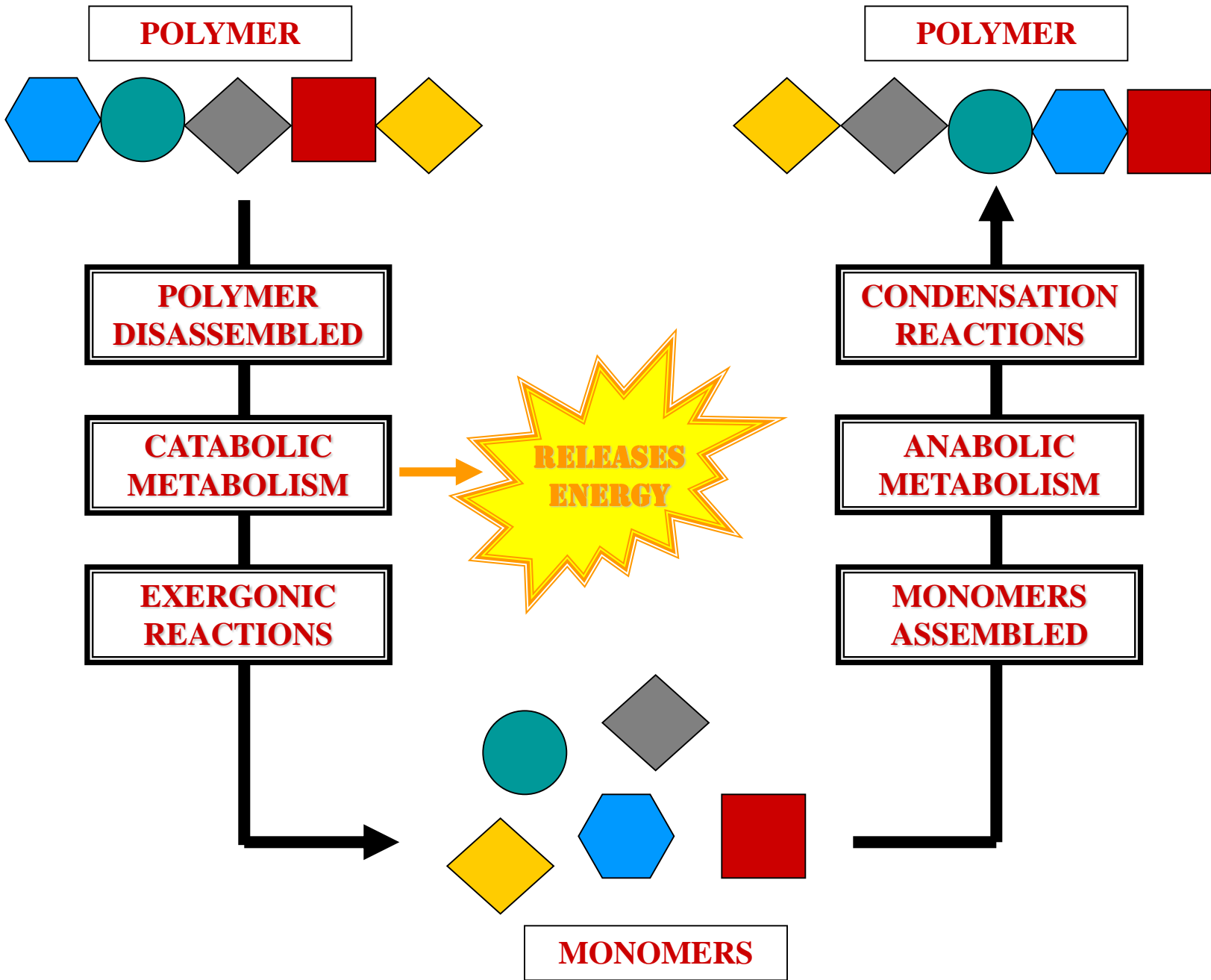


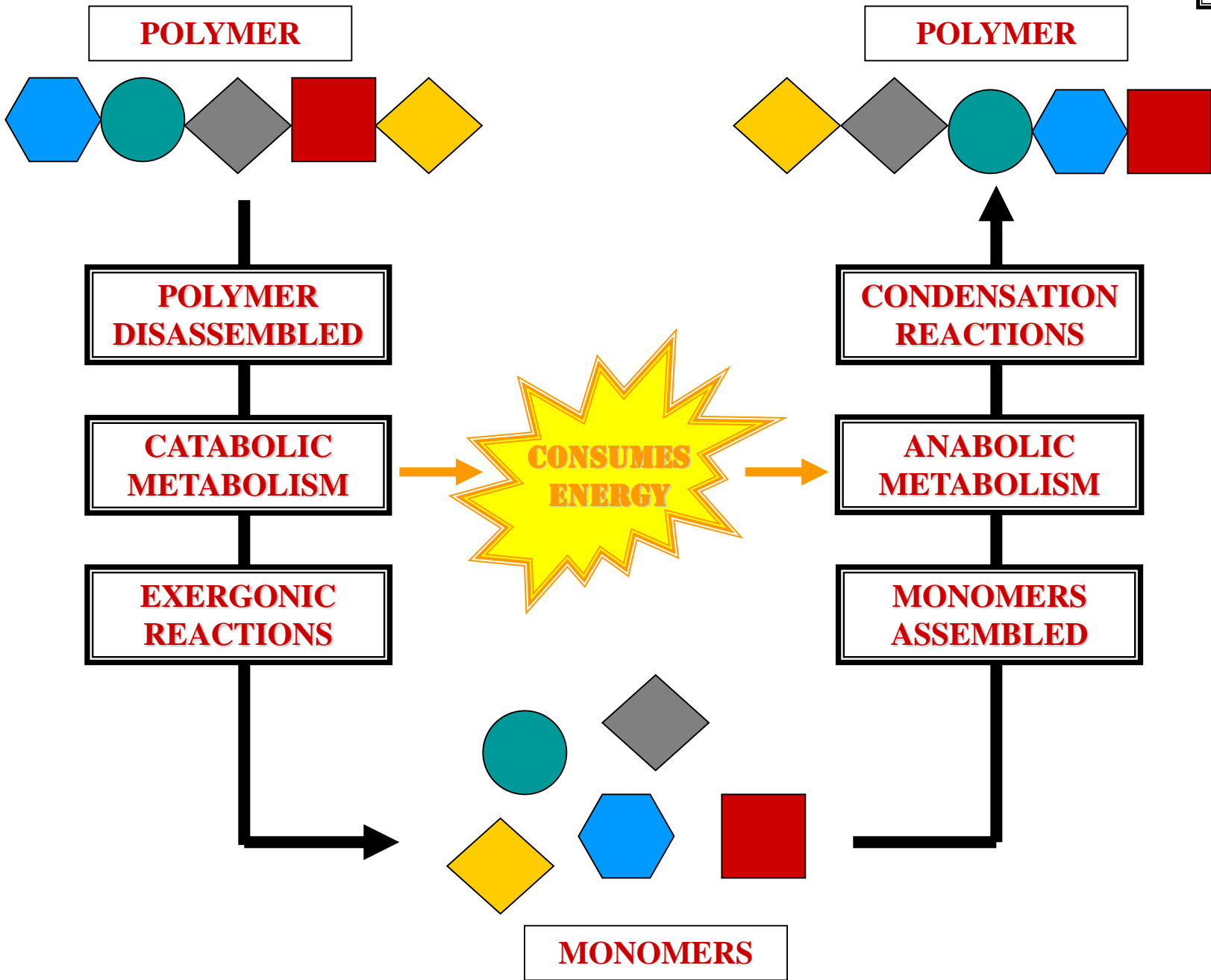


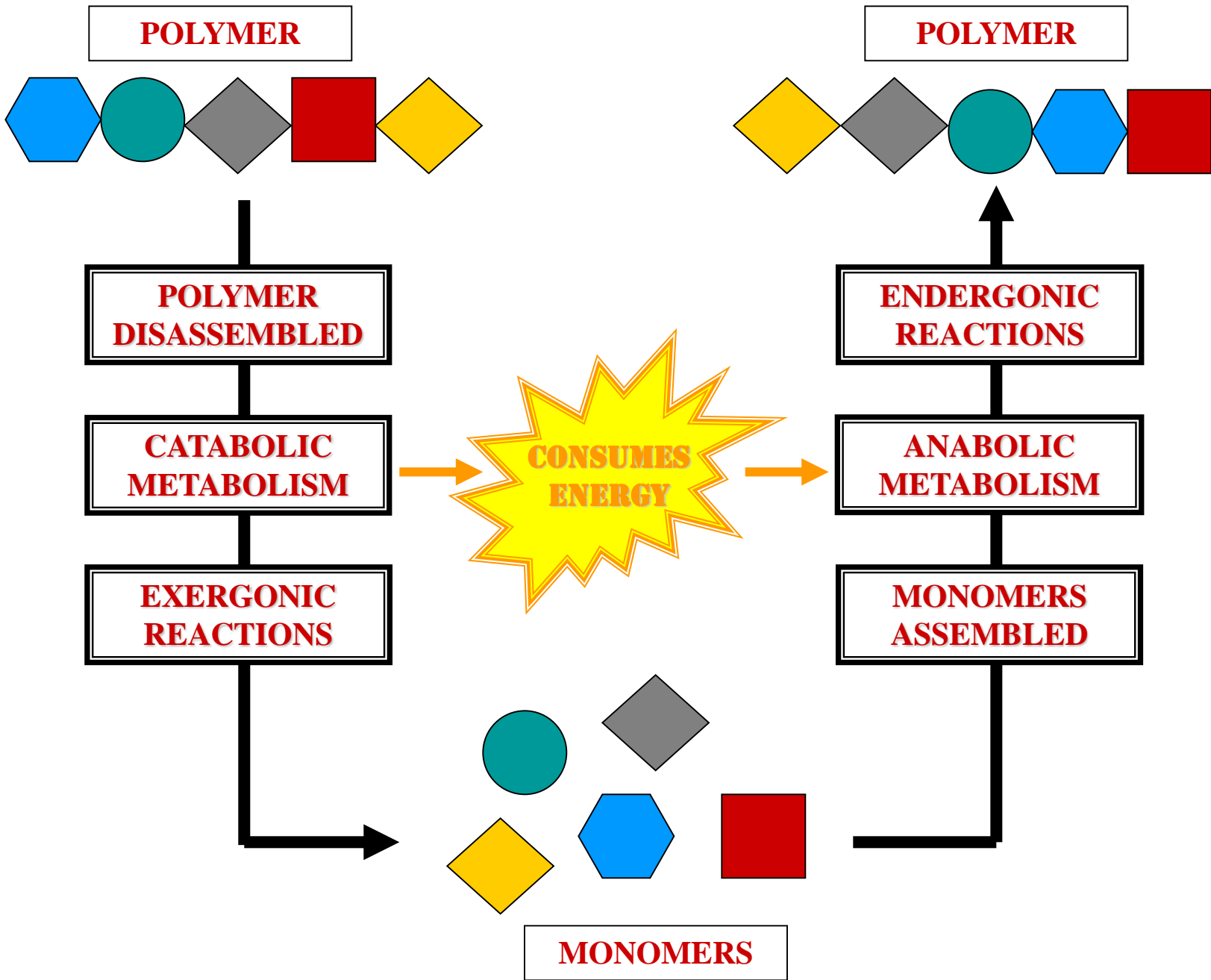












**ENDERGONIC
REACTIONS
&
EXERGONIC
REACTIONS
?**

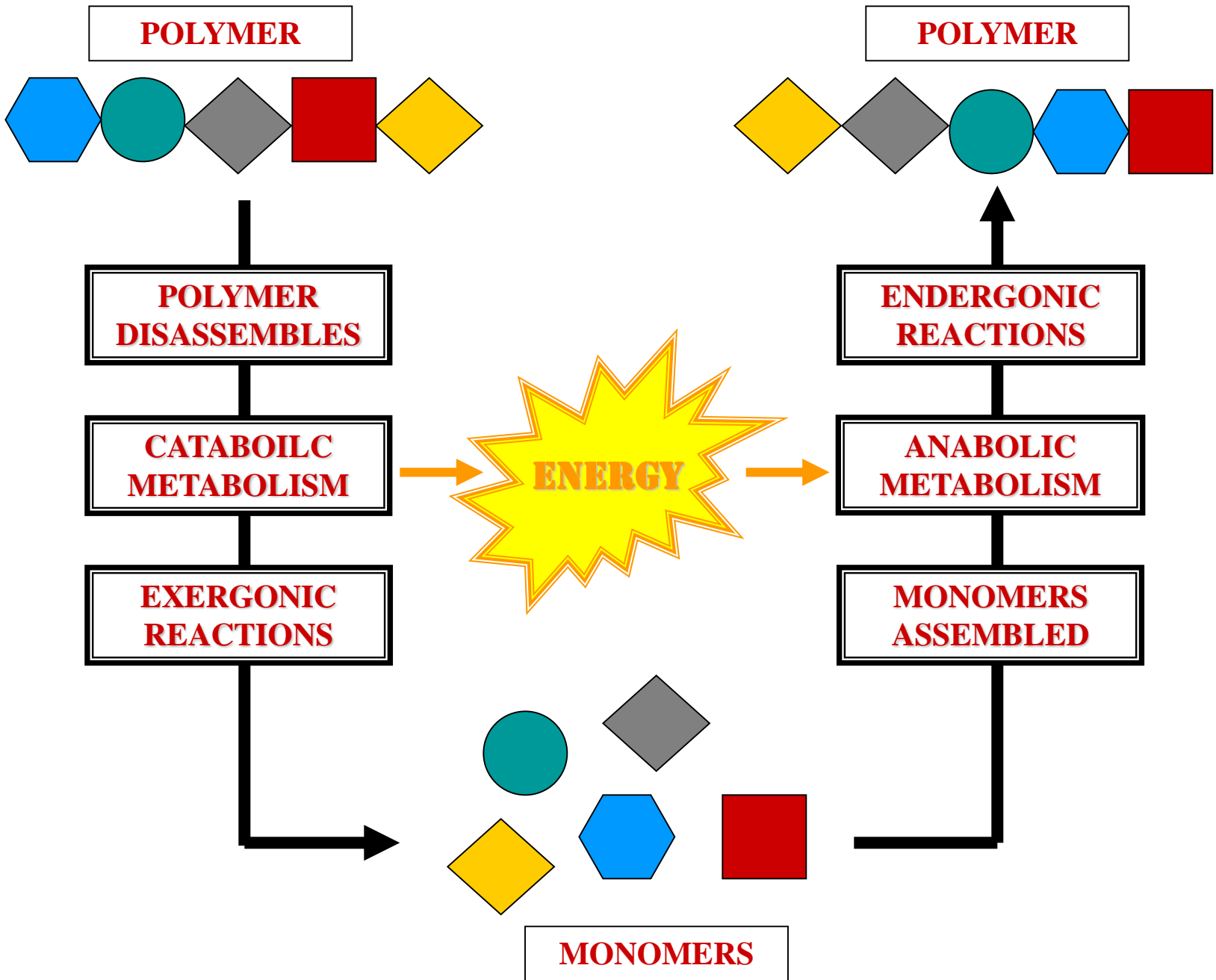
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ENDERGONIC REACTIONS & EXERGONIC REACTIONS



!!!COUPLED!!!





ENERGY



PHOTOSYNTHESIS & RESPIRATION

QUESTION



**WHAT IS THE
INITIAL BIO-EGY
SOURCE?**

QUESTION

LIVING ORGANISMS



LIVING ORGANISMS

LIVING ORGANISMS

EARTH

INITIAL BIO-ENERGY SOURCE

**LIGHT
ENERGY**

INITIAL BIO-ENERGY SOURCE

SUN / STAR