



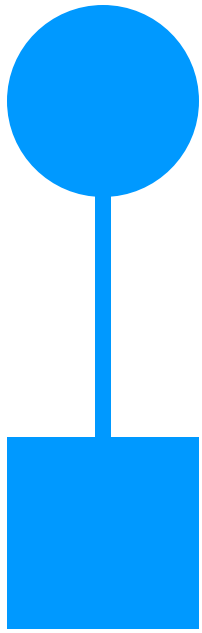
ACTIVATION ENERGY

**MINIMUM REQUIRED
CHEMICAL REACTION
ENERGY**

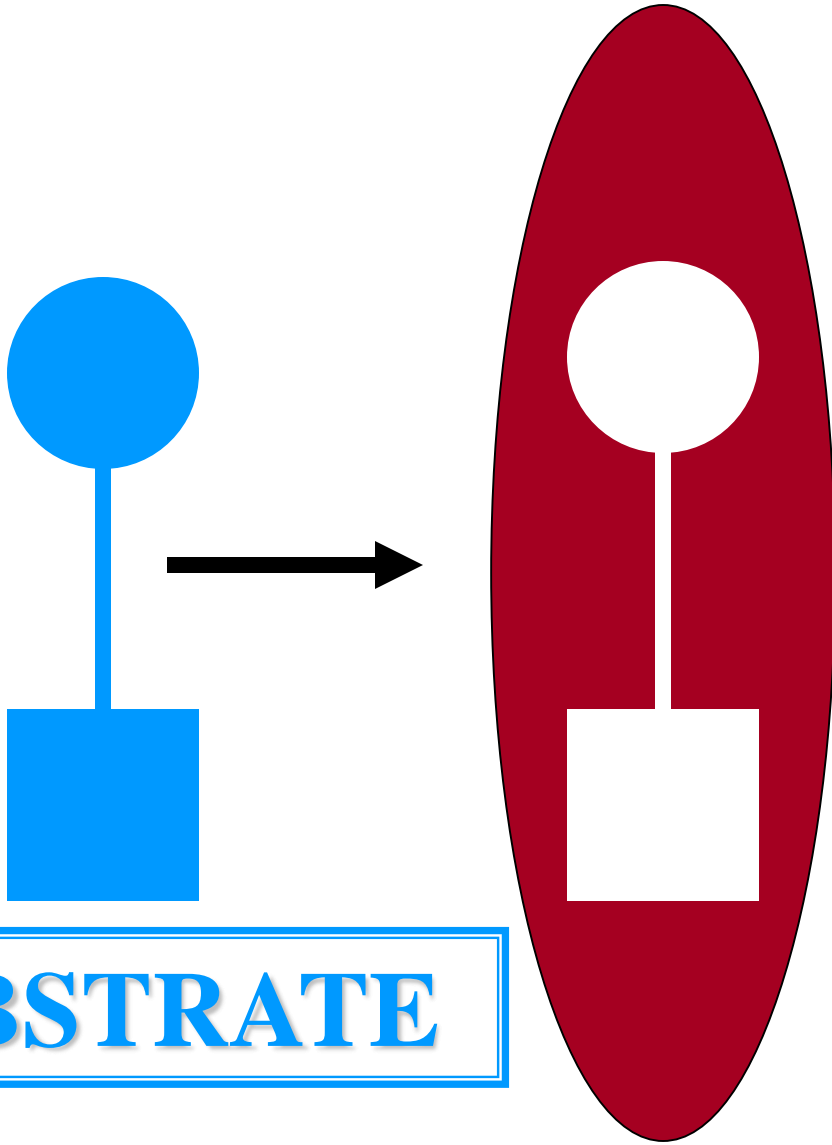
ACTIVATION ENERGY



SUBSTRATE & ENZYMES INTERACTION

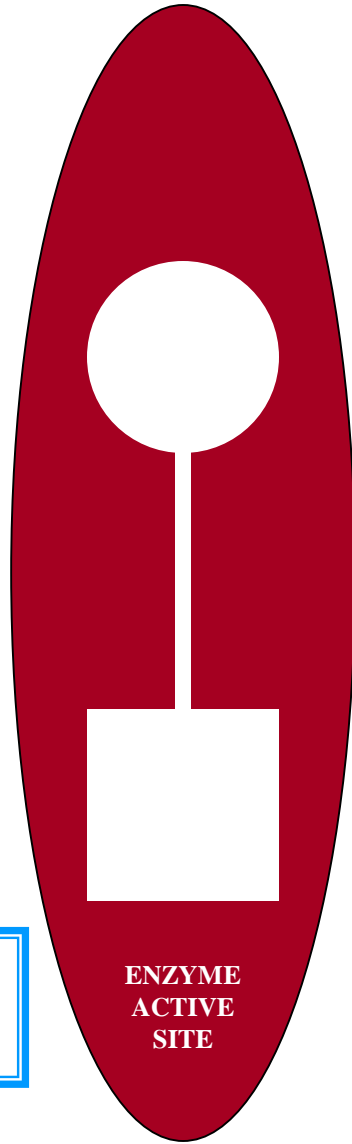
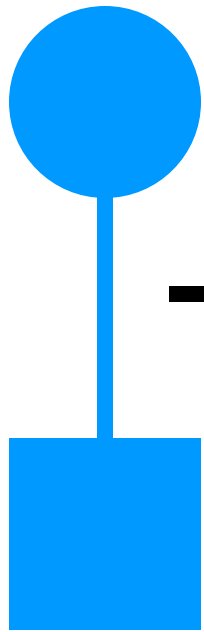


SUBSTRATE



SUBSTRATE

ENZYME



**ACTIVE
SITE**

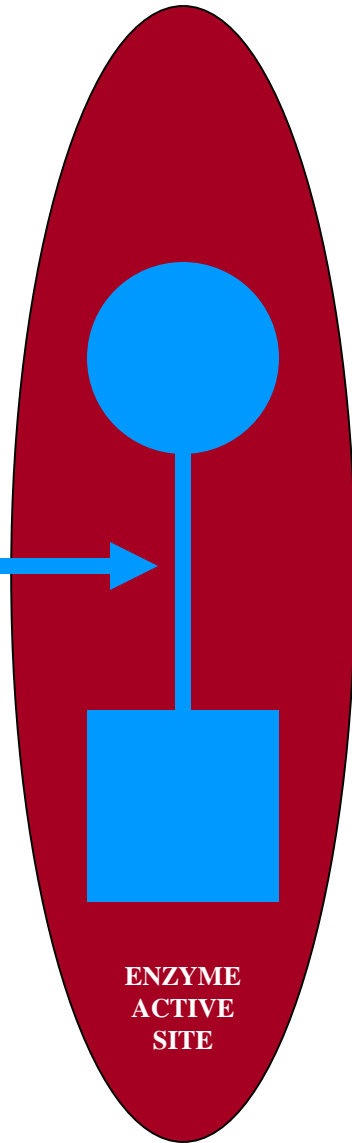
SUBSTRATE

ENZYME

ENZYME
ACTIVE
SITE

SUBSTRATE & ENZYME INTERACTION

SUBSTRATE



**ACTIVE
SITE**

ENZYME

ENZYME ACTIVE SITE

ACTIVE SITE



ACTIVE SITE

ENZYME REGION

ACTIVE SITE



ACTIVE SITE

ENZYME REGION

**INTERACTS WITH
SUBSTRATE →**

ACTIVE SITE



ACTIVE SITE

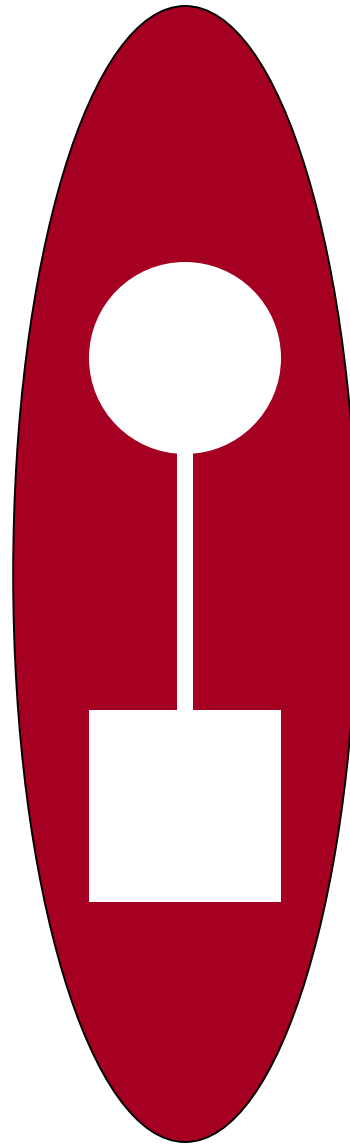
ENZYME REGION

INTERACTS WITH

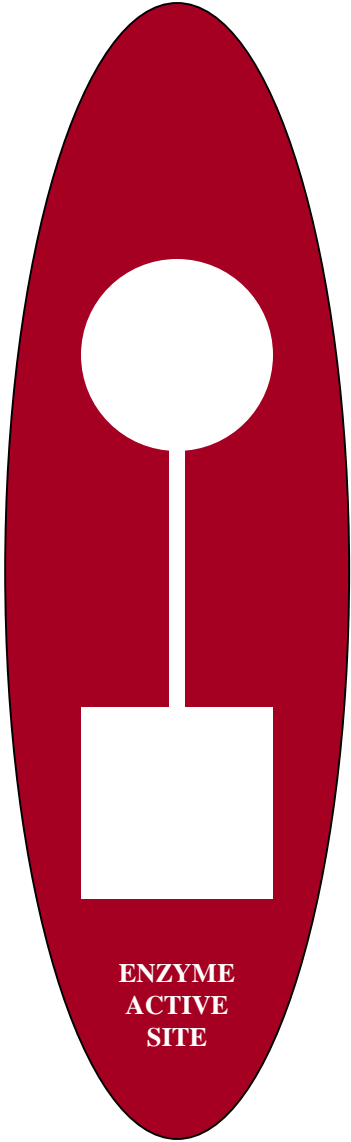
SUBSTRATE →

SUB/ENZ COMPLEX

ACTIVE SITE

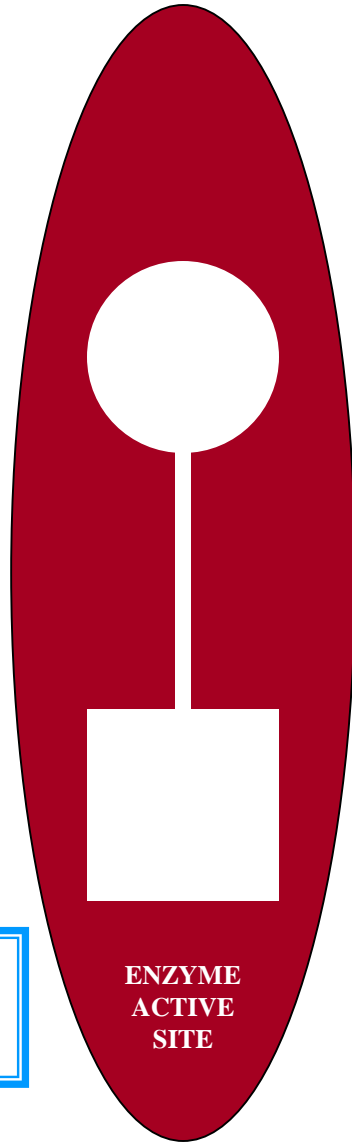
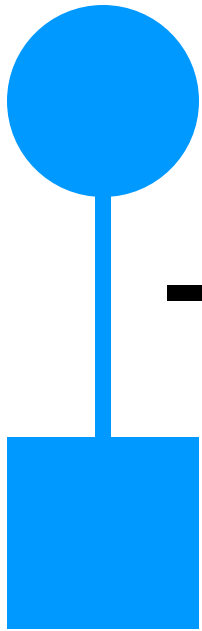


ENZYME



**ACTIVE
SITE**

ENZYME

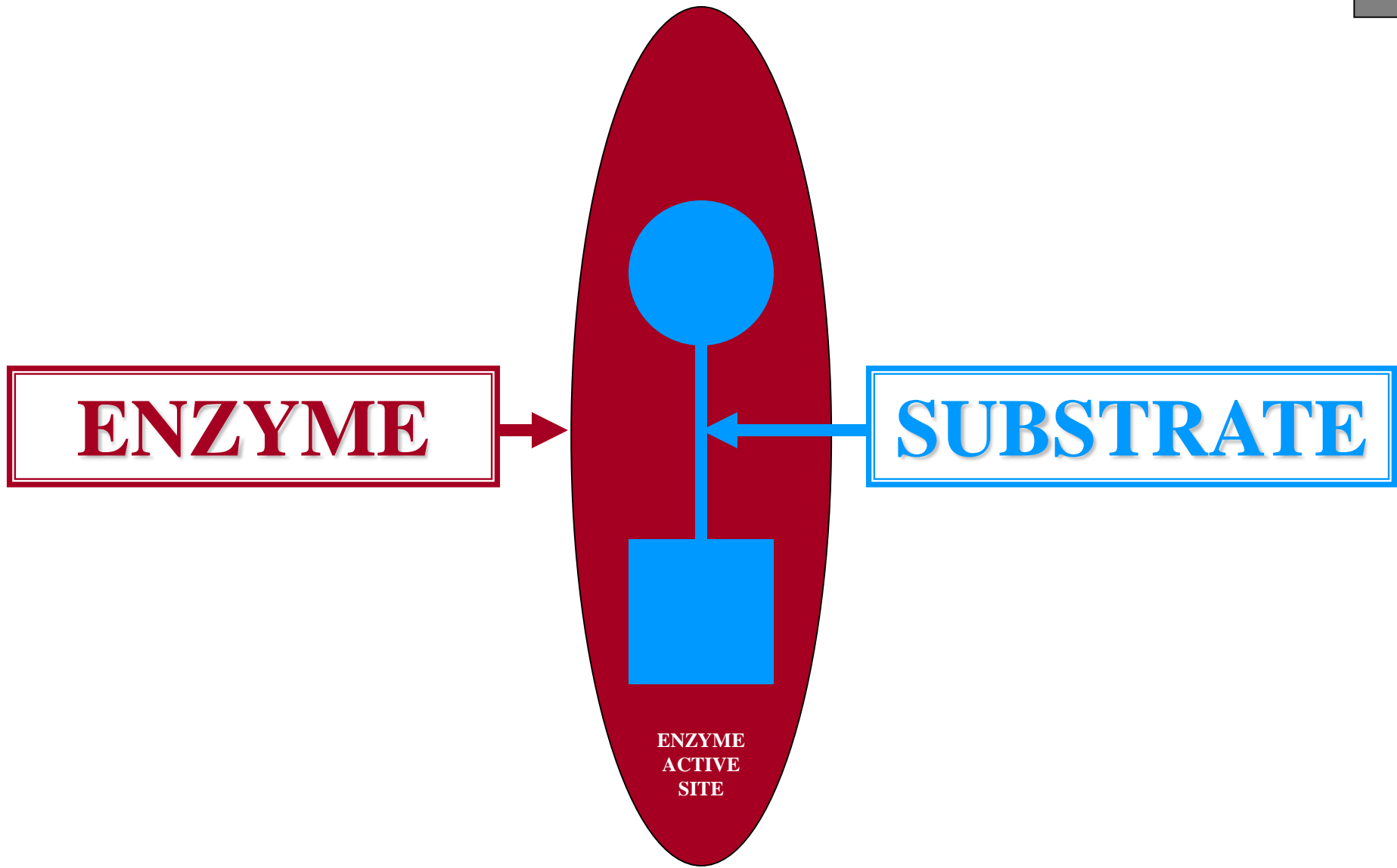


**ACTIVE
SITE**

SUBSTRATE

ENZYME
ACTIVE
SITE

ENZYME

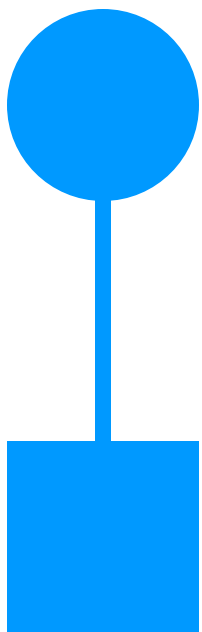


SUBSTRATE / ENZYME COMPLEX

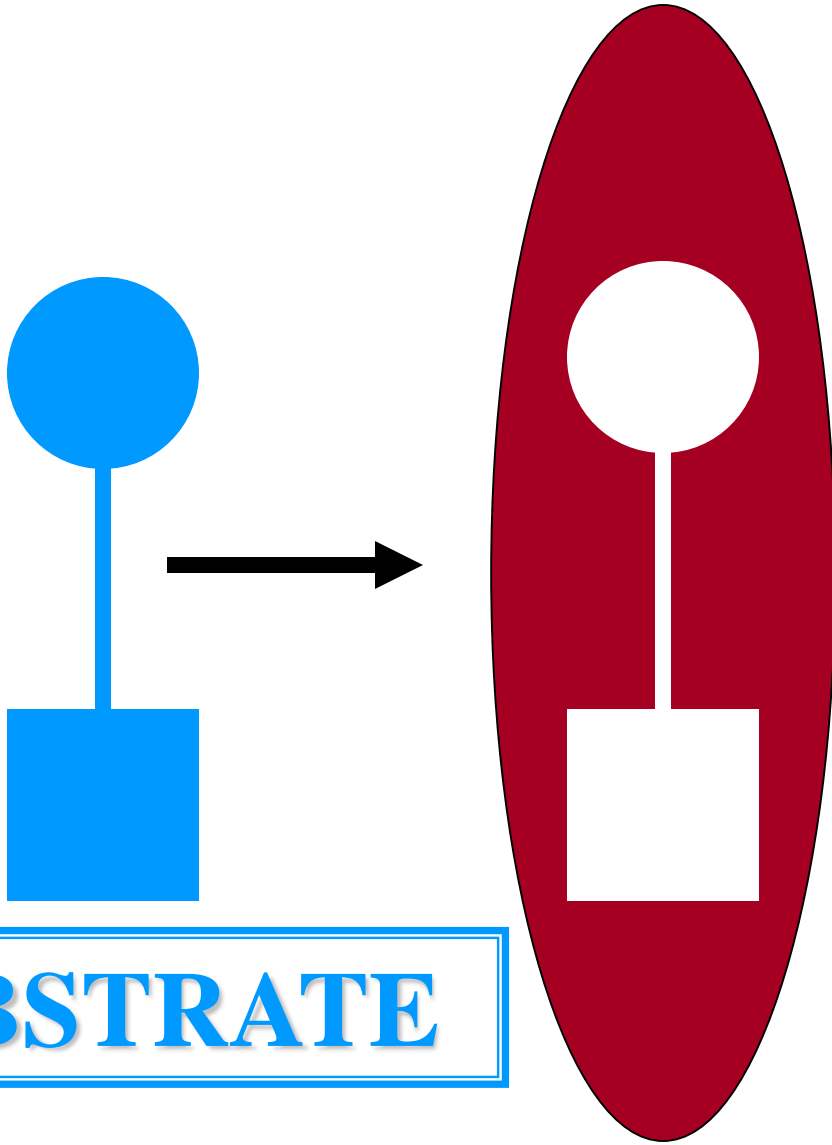
**“LOCK & KEY”
ANALOGY
OR
“INDUCED FIT”
ANALOGY**



“LOCK & KEY” ANALOGY

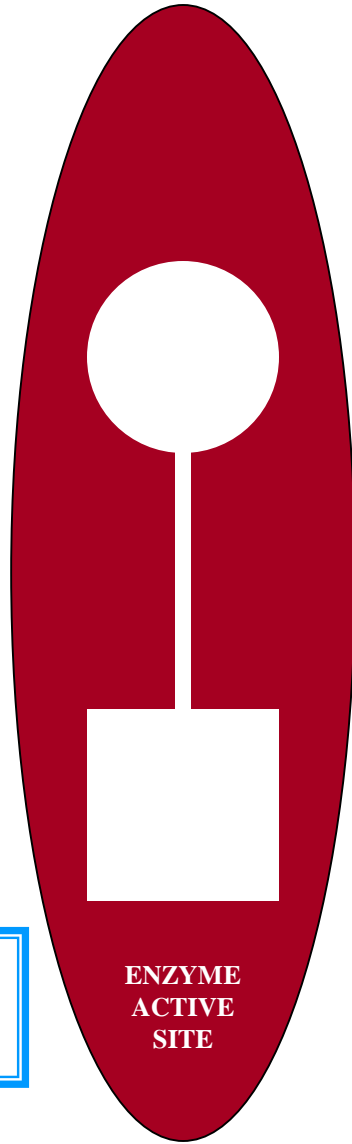
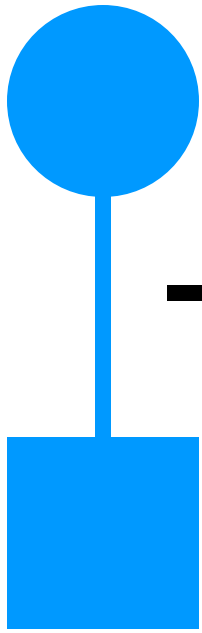


SUBSTRATE



SUBSTRATE

ENZYME



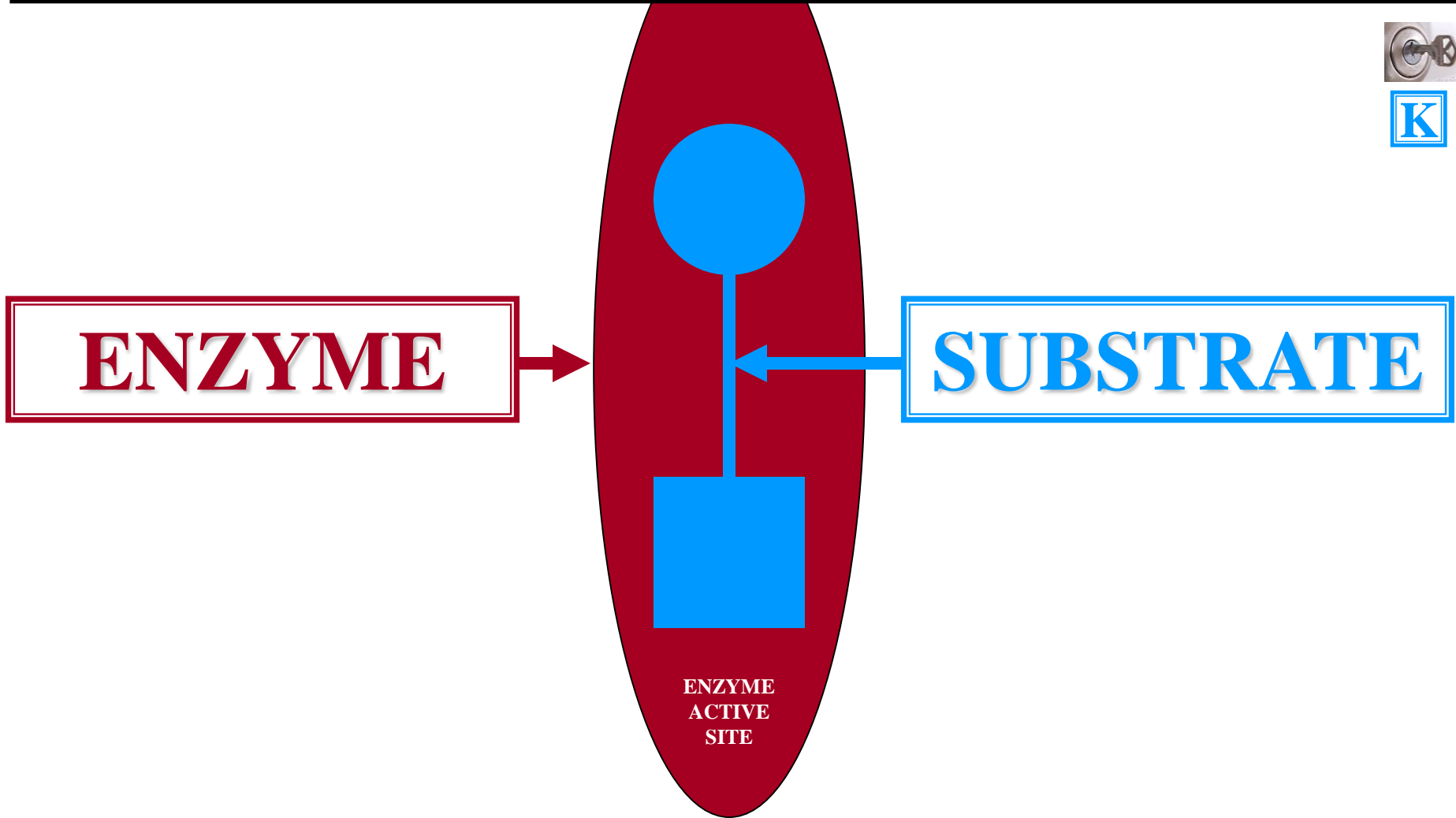
**ACTIVE
SITE**

SUBSTRATE

ENZYME

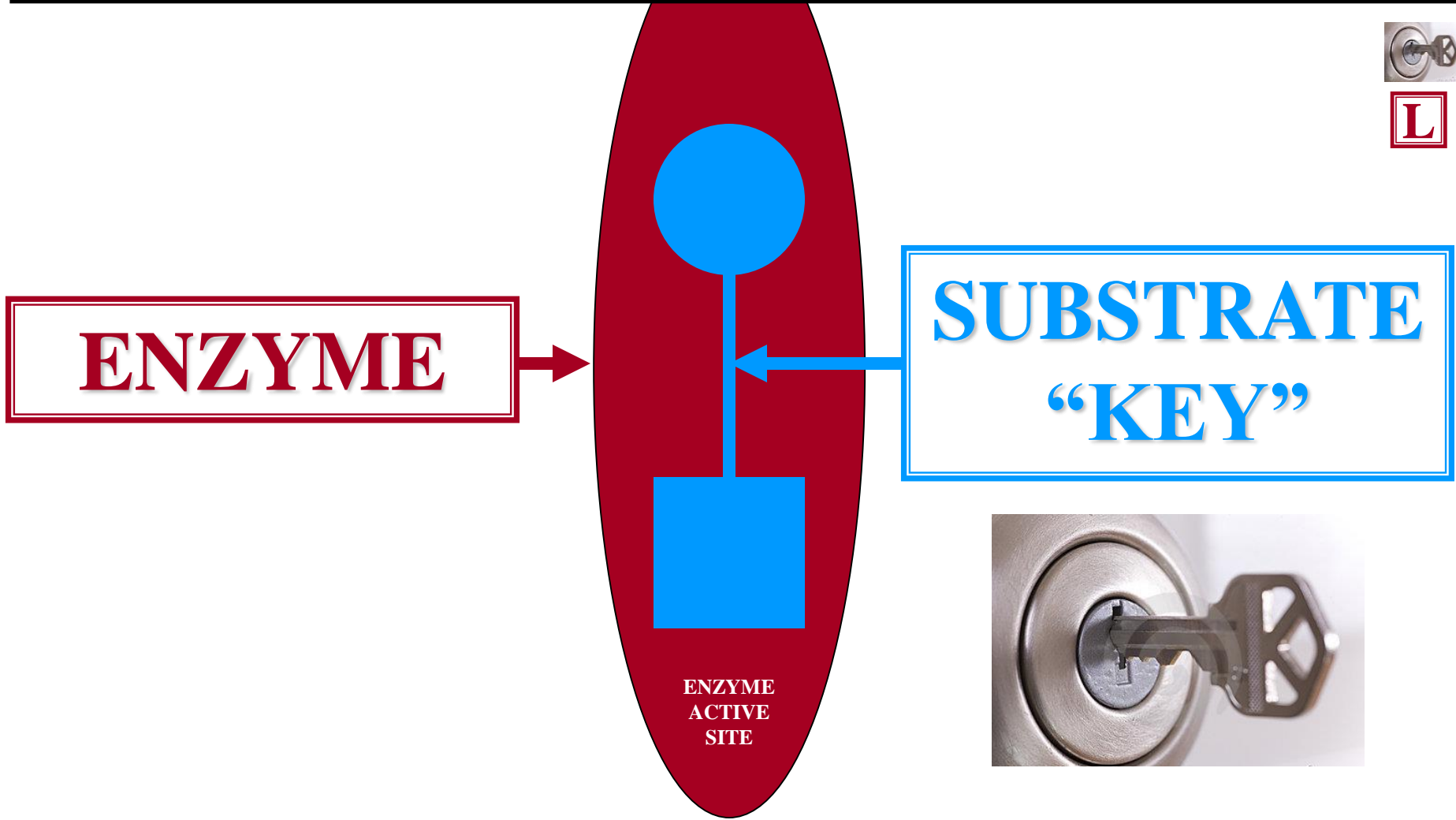
ENZYME
ACTIVE
SITE

SUBSTRATE / ENZYME COMPLEX



LOCK & KEY ANALOGY

SUBSTRATE / ENZYME COMPLEX



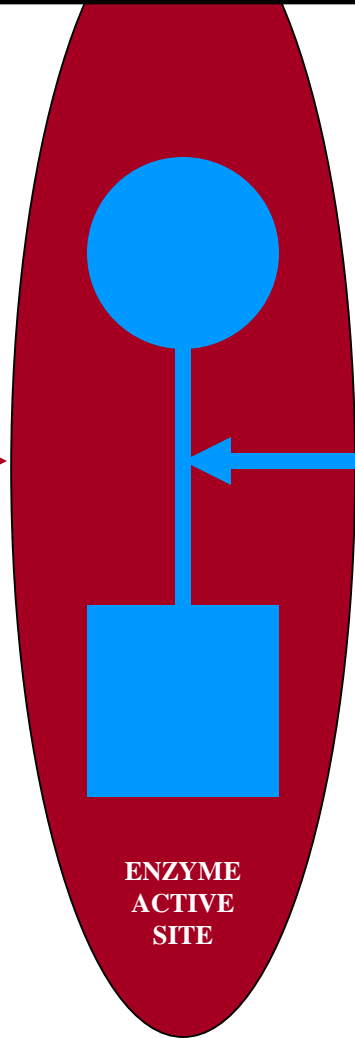
LOCK & KEY ANALOGY

SUBSTRATE / ENZYME COMPLEX



**ENZYME
“LOCK”**

**SUBSTRATE
“KEY”**




ENZYME
ACTIVE
SITE

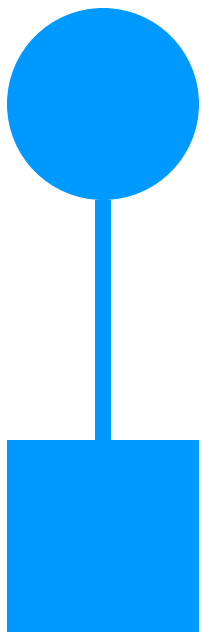
LOCK & KEY ANALOGY



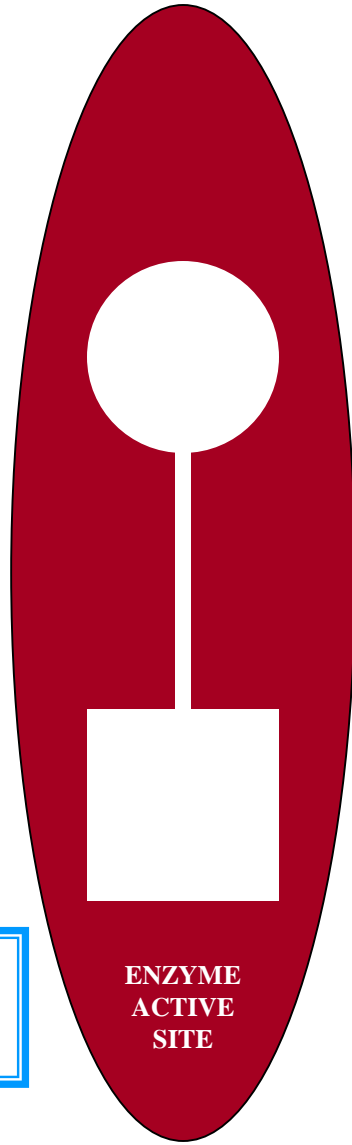
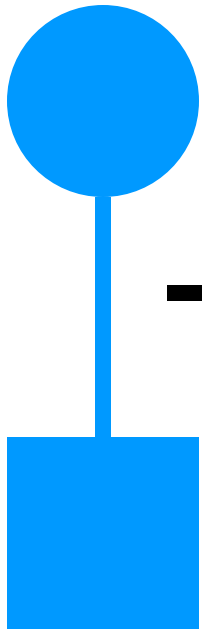
***ENZYME
ACTIVE SITE
SUBSTRATE
SPECIFIC***



**SUBSTRATE
ENZYME
INTERACTION
APPLIED**



SUBSTRATE

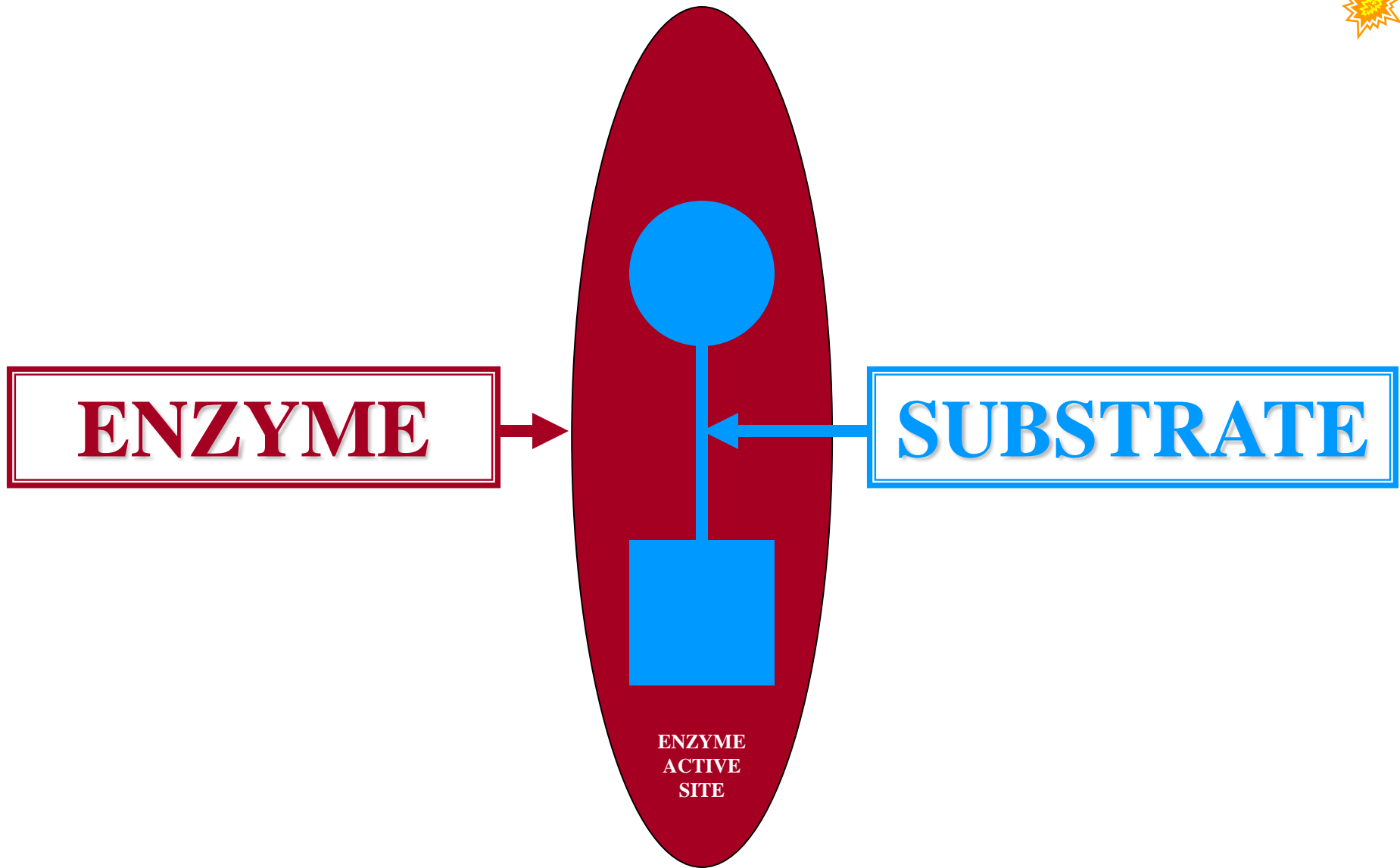


**ACTIVE
SITE**

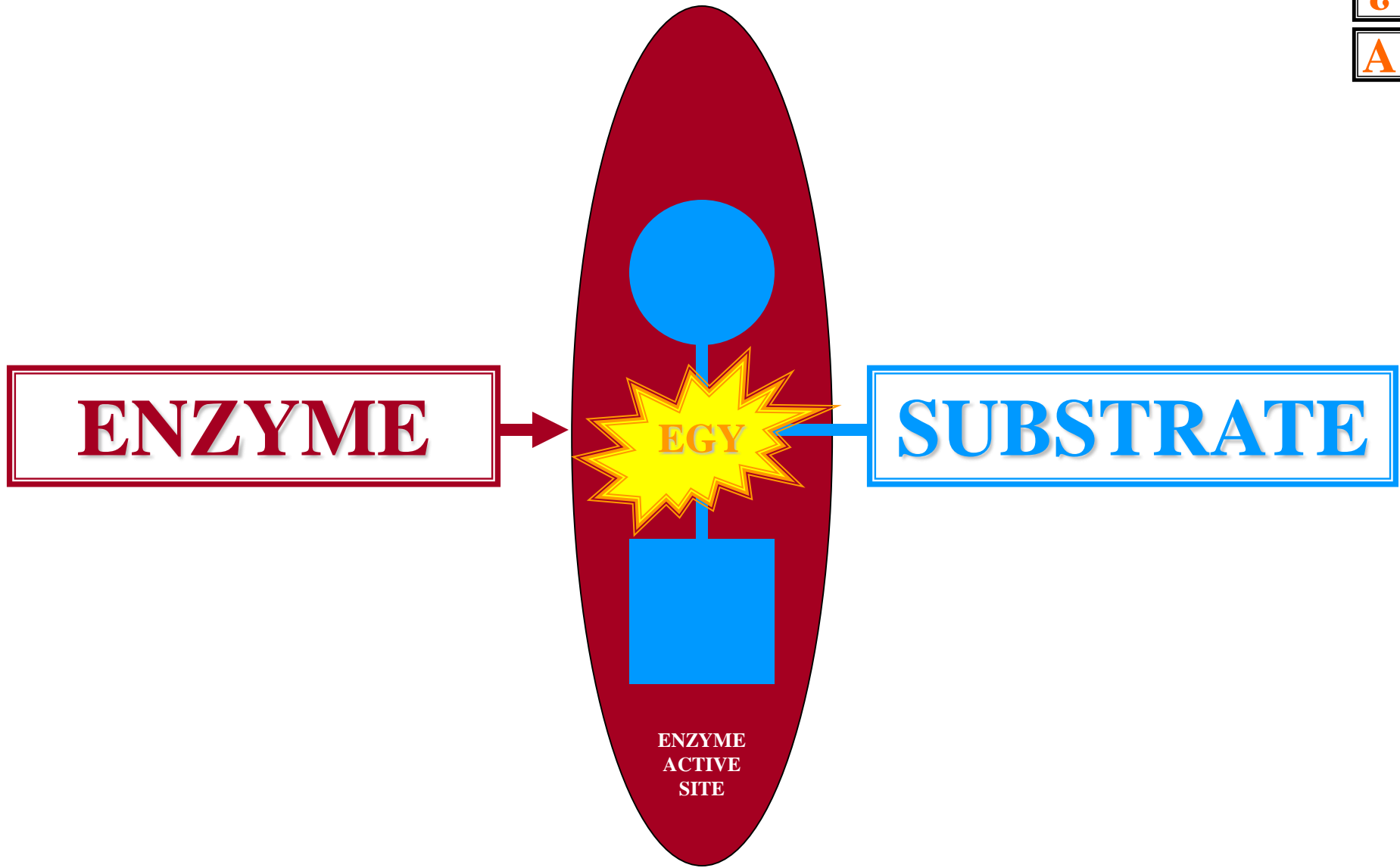
SUBSTRATE

ENZYME

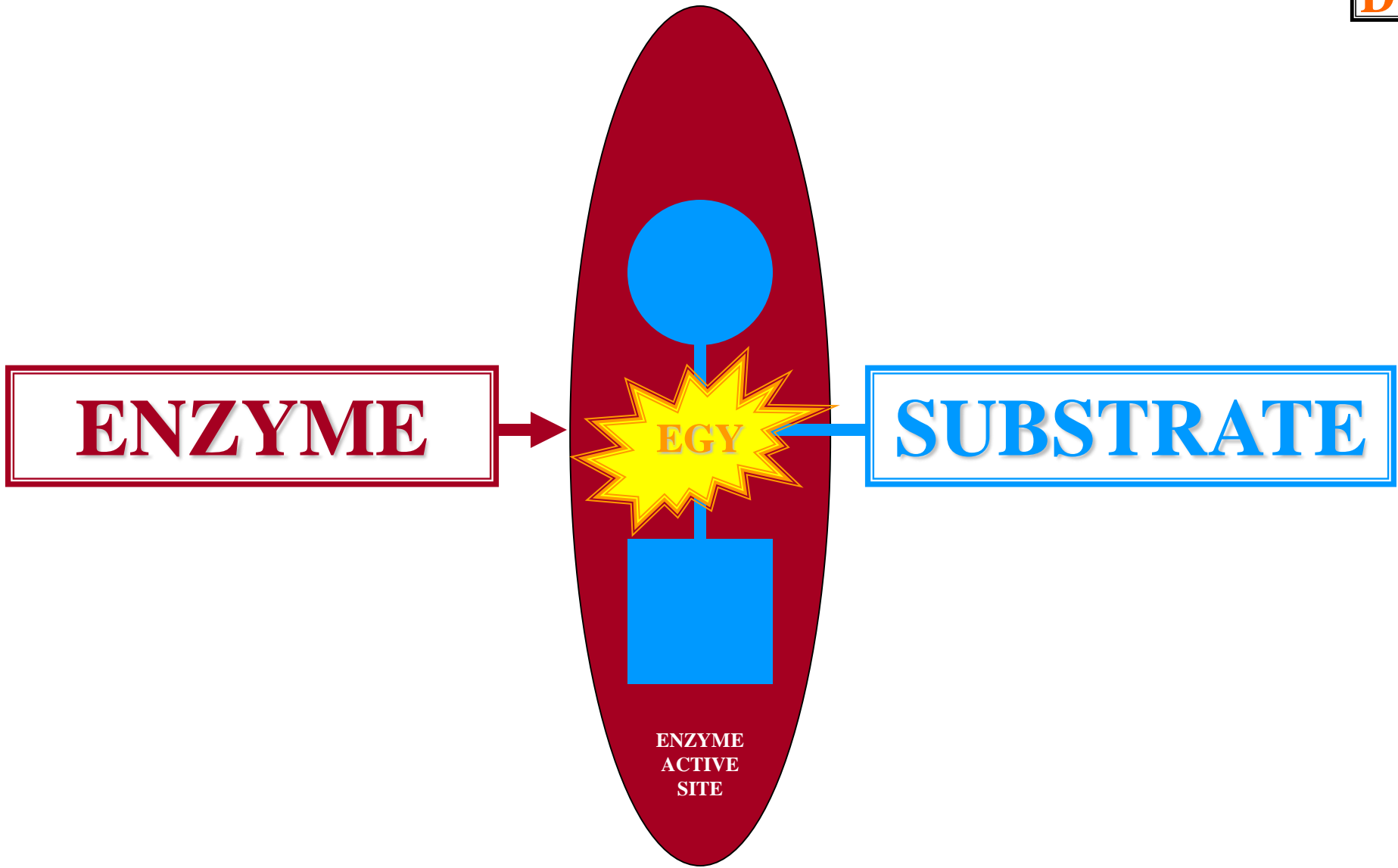
ENZYME
ACTIVE
SITE



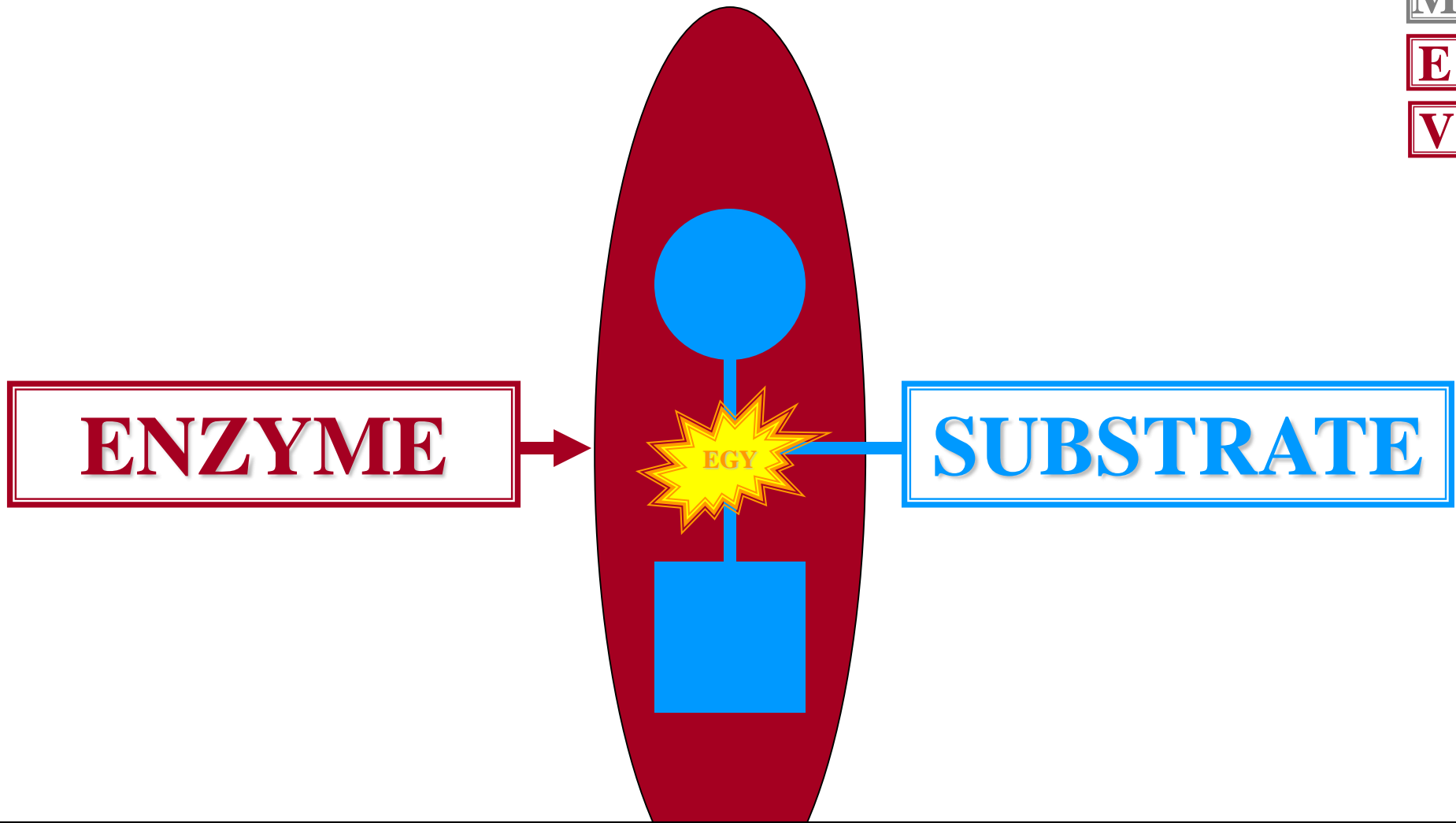
SUBSTRATE / ENZYME COMPLEX



ENERGY INPUT



ACTIVATION ENERGY



**ENZYMES DECREASE
ACTIVATION ENERGY**

METABOLISM

GLUCOSE

METABOILSM

HEXOKINASE

ATP

EGY

ADP

E
D

GLUCOSE-6-PHOSPHATE

ENZYMES

PHOSPHOGLUCOISOMERASE

ENZYMES

FRUCTOSE-6-PHOSPHATE

PHOSPHOFRUCTOKINASE

ATP

EGY

ADP

FRUCTOSE-1-6-PHOSPHATE

RED = ENZYME

METABOLISM

GLUCOSE

METABOILSM

HEXOKINASE



ATP



ADP

GLUCOSE-6-PHOSPHATE

PHOSPHOGLUCOISOMERASE

FRUCTOSE-6-PHOSPHATE

PHOSPHOFRUCTOKINASE

ATP



ADP

FRUCTOSE-1-6-PHOSPHATE

ENZYMES
DECREASES
ACTIVATION ENERGY

ENZYMES
DECREASES
ACTIVATION ENERGY

RED = ENZYME



***ENZYMES
ENSURE
EFFICIENT
METABOLISM***

E



***ORANIZATION
INCREASES***



***ENTROPY
DECREASES***

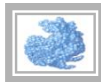


HOMEOSTASIS



CO-FACTORS

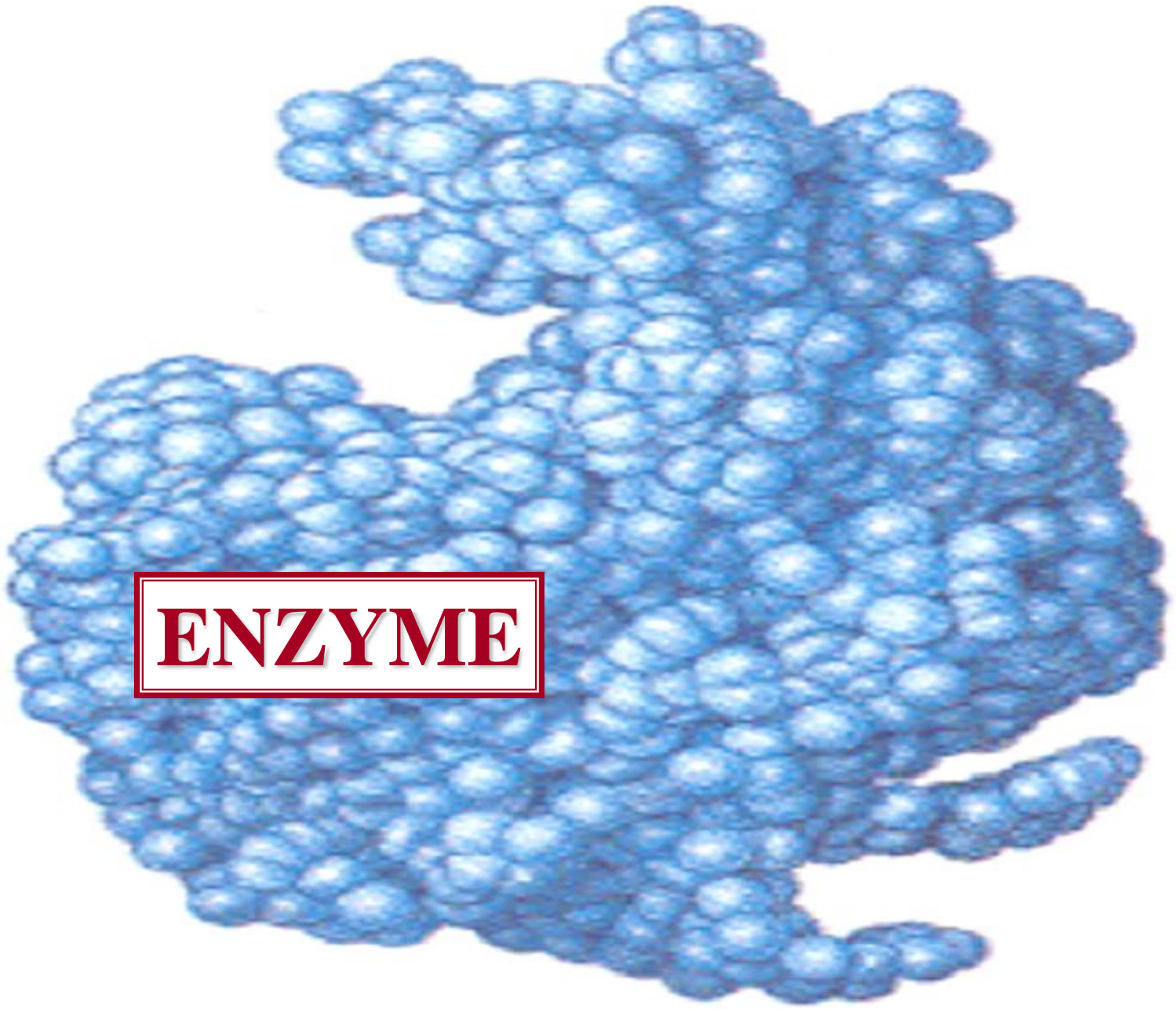
CO-FACTOR



CO-FACTOR

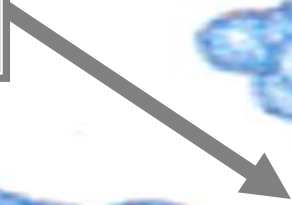
**INORGANIC OR ORGANIC
ENZYME PROMOTOR**

CO-FACTOR

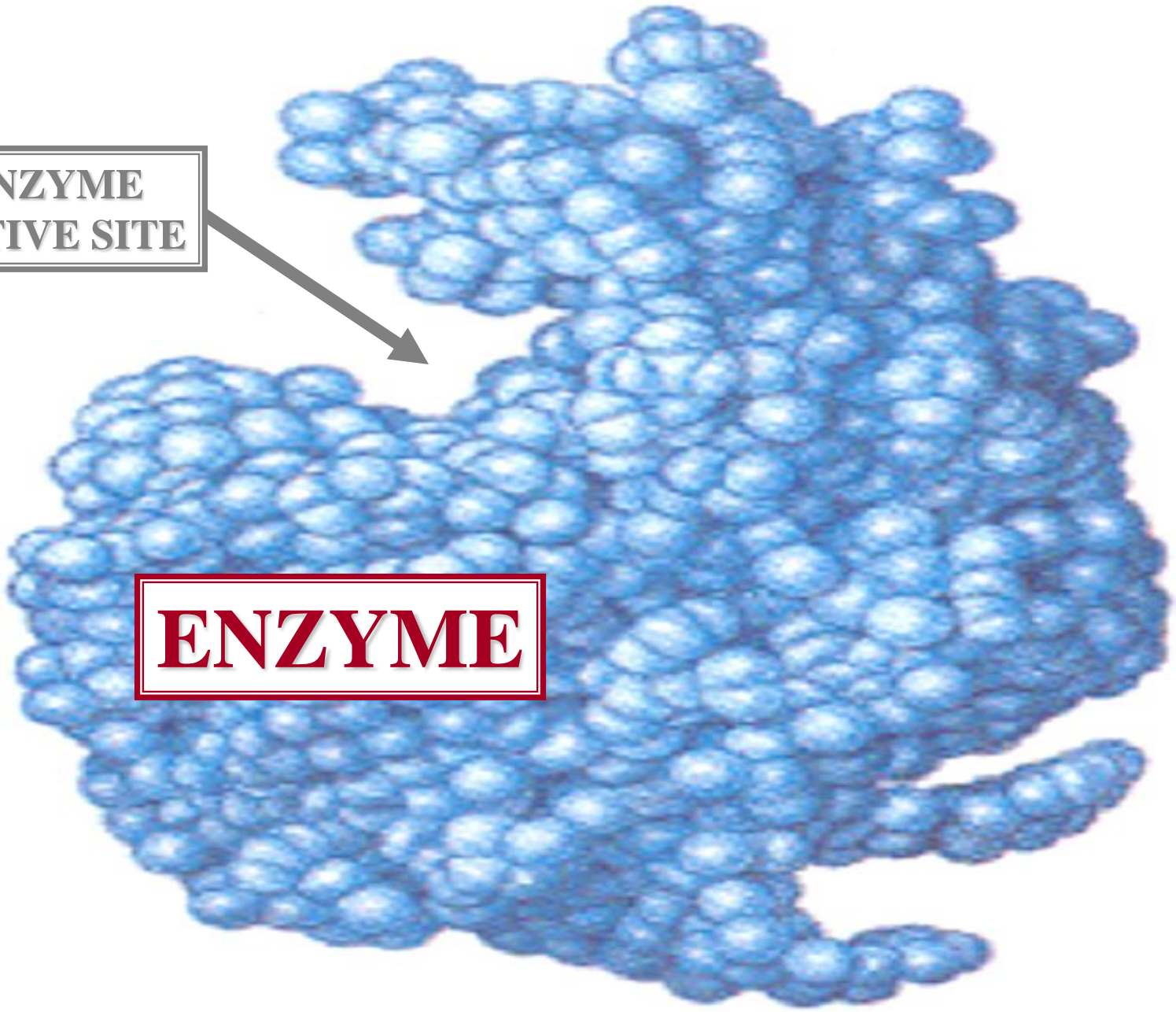


ENZYME

**ENZYME
ACTIVE SITE**



ENZYME





SUBSTRATE

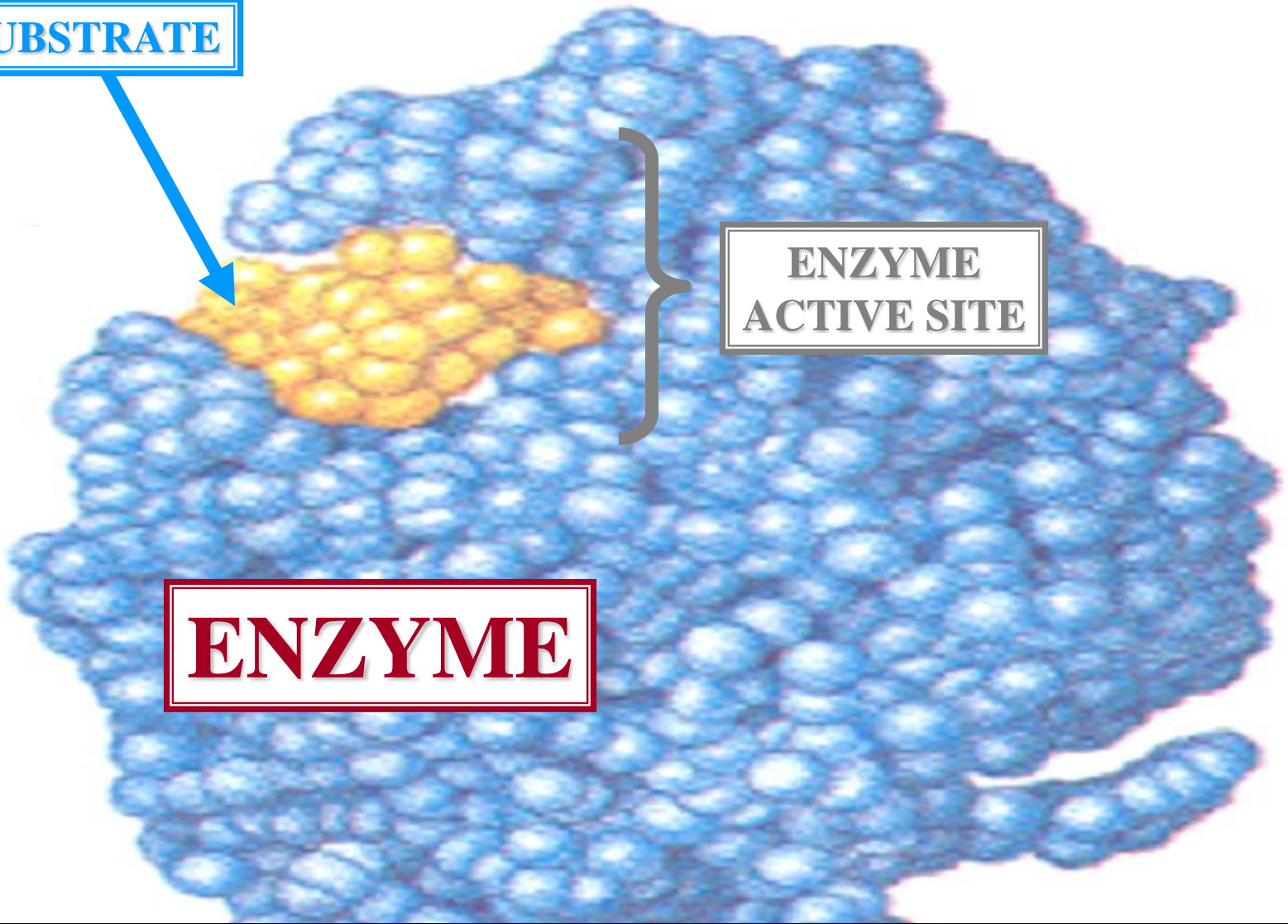


**ENZYME
ACTIVE SITE**



ENZYME

SUBSTRATE / ENZYME COMPLEX



SUBSTRATE



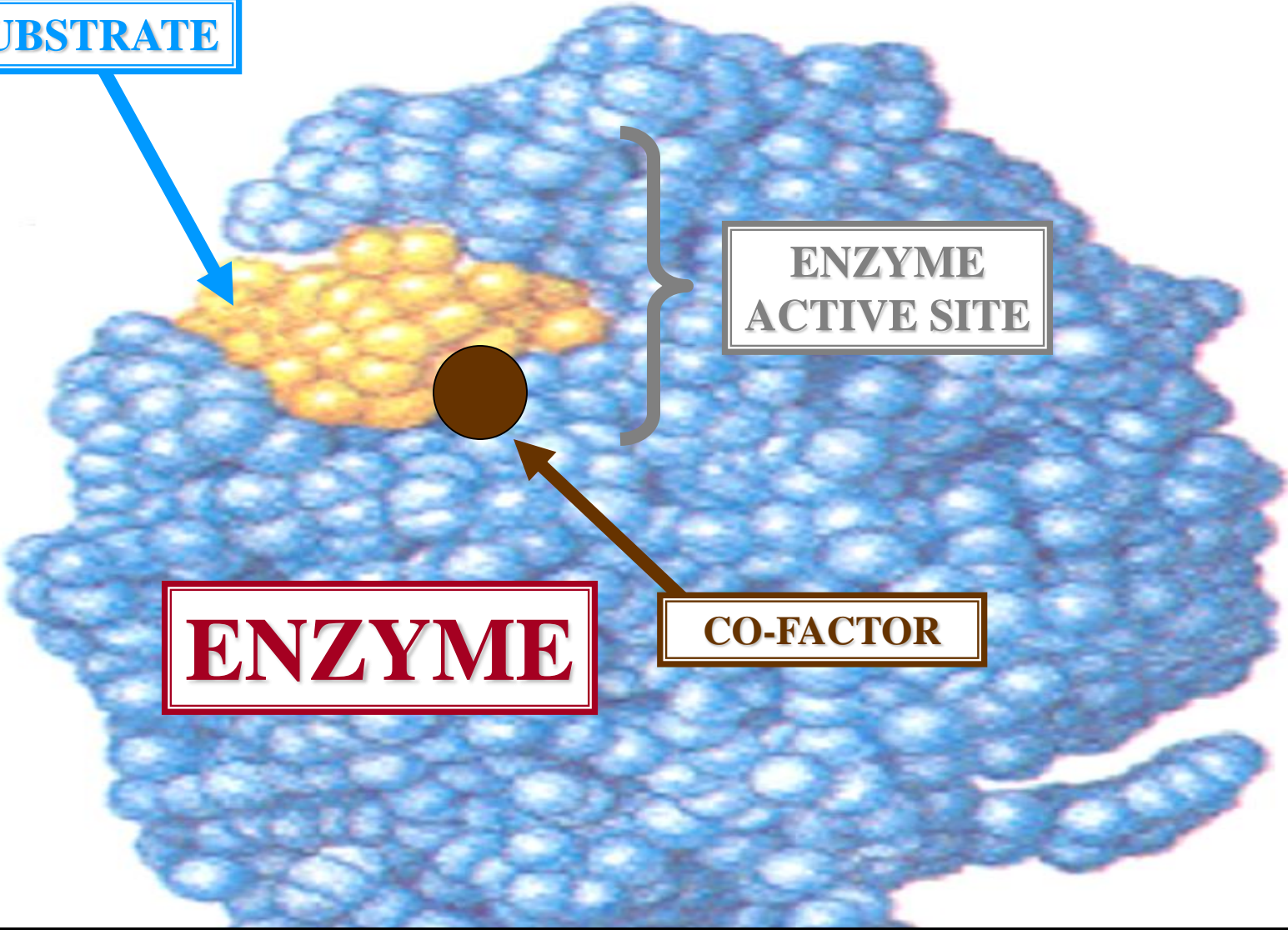
ENZYM
ACTIVE SITE



ENZYM

CO-FACTOR

SUBSTRATE / ENZYME COMPLEX



SUBSTRATE



**ENZYME
ACTIVE SITE**



ENZYME

CO-FACTOR

ASSISTS SUB/ENZ INTERACTION

SUBSTRATE / ENZYME COMPLEX

SUBSTRATE



ENZYME ACTIVE SITE



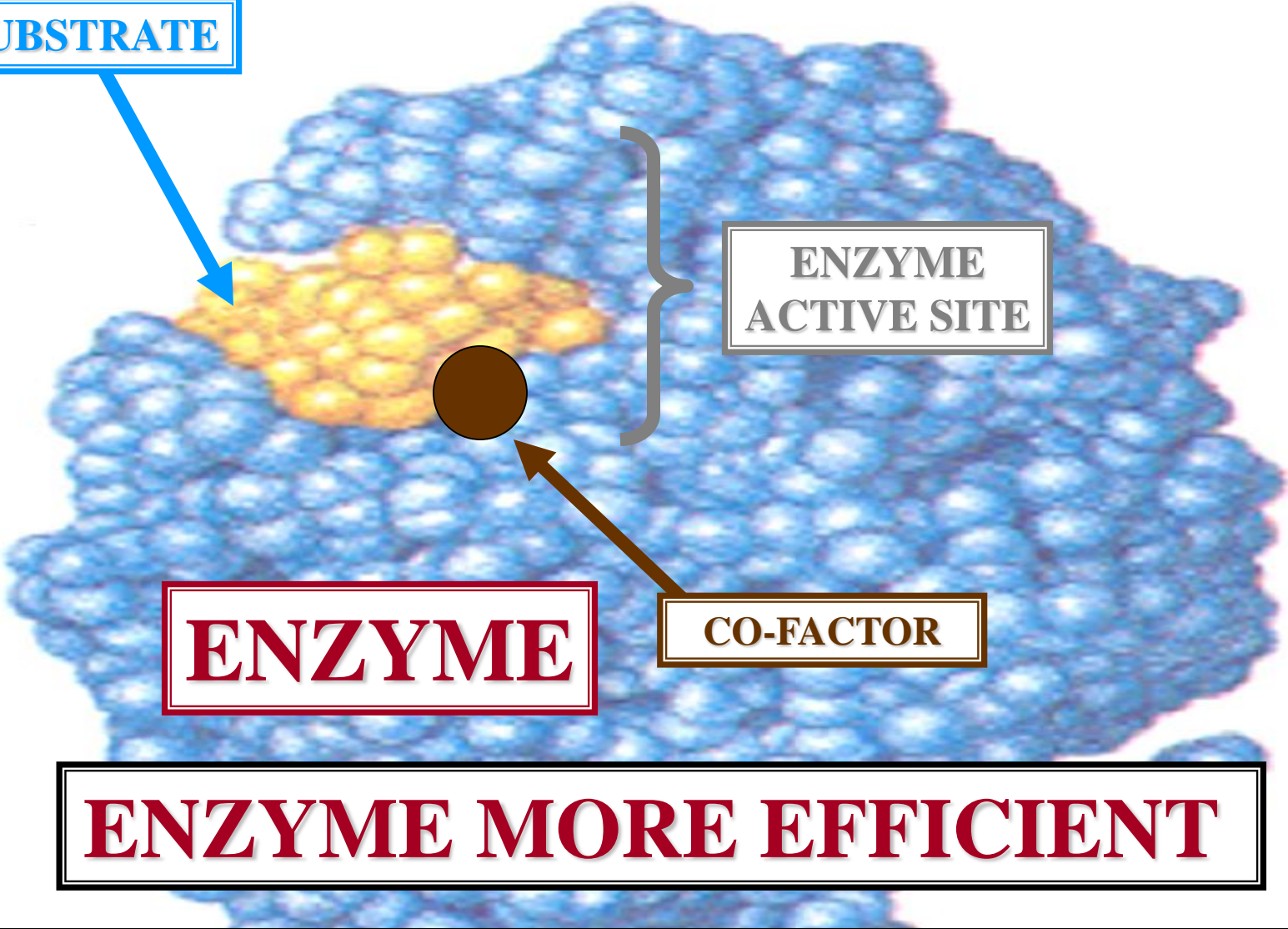
ENZYME

CO-FACTOR



ENZYME MORE EFFICIENT

SUBSTRATE / ENZYME COMPLEX



SUBSTRATE



ENZYME
ACTIVE SITE

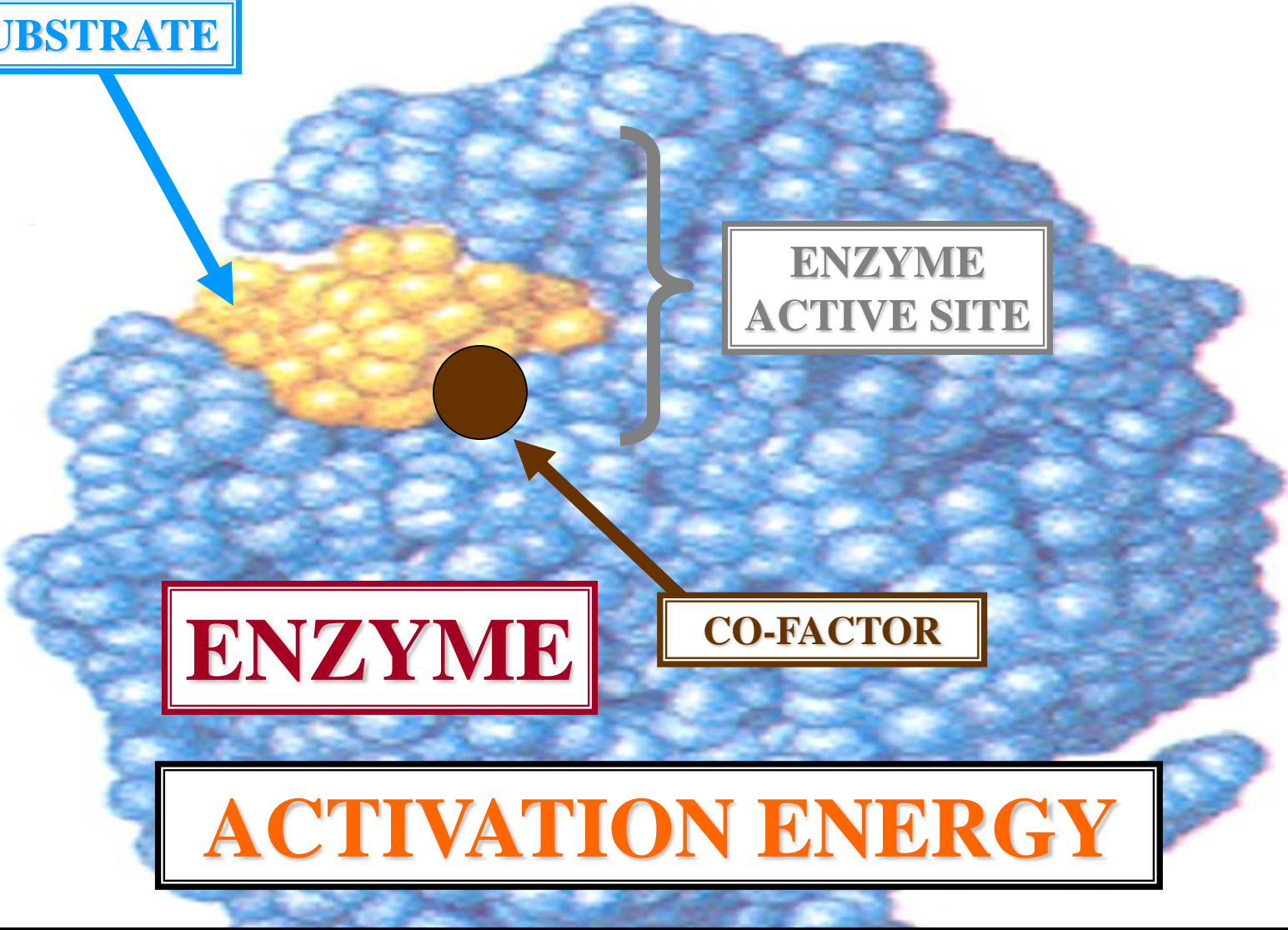


CO-FACTOR

ENZYME

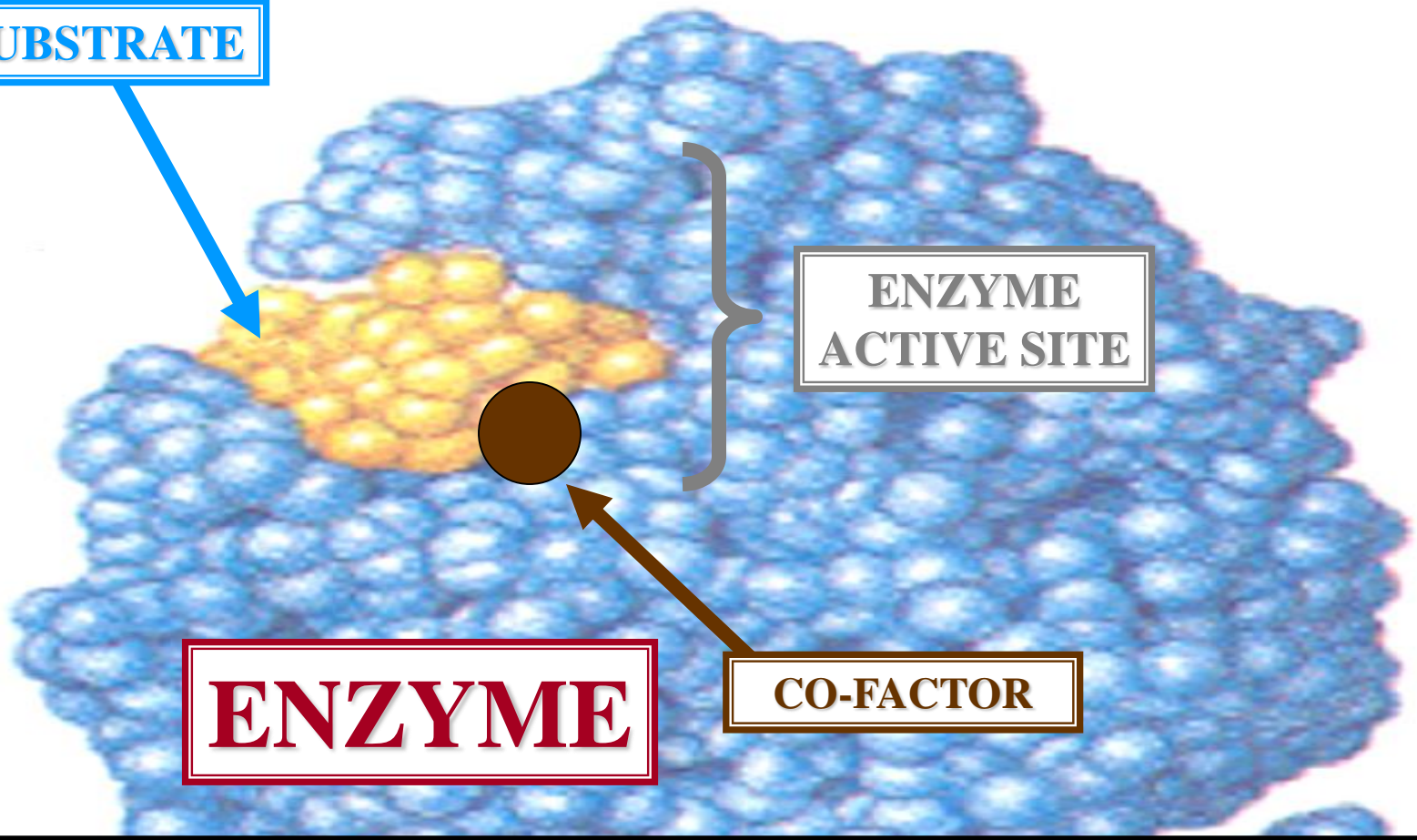
ACTIVATION ENERGY

SUBSTRATE / ENZYME COMPLEX





SUBSTRATE



**ENZYME
ACTIVE SITE**

ENZYME

CO-FACTOR



DECREASES ACTIVATION ENERGY

SUBSTRATE / ENZYME COMPLEX



***COFACTORS
ENSURE
EFFICIENT
METABOLISM***

An electron micrograph showing a cross-section of a cell. The nucleus is prominent, containing dense chromatin and a nucleolus. The cytoplasm is filled with numerous mitochondria, which appear as elongated, dark structures with internal cristae. The overall organization is highly structured and organized.

E



***ORGANIZATION
INCREASES***

***ENTROPY
DECREASES***

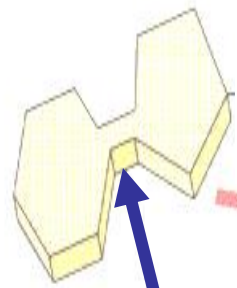


HOMEOSTASIS





**SUBSTRATE
&
ENZYME
INTERACTION
SUMMARY**



SUCROSE

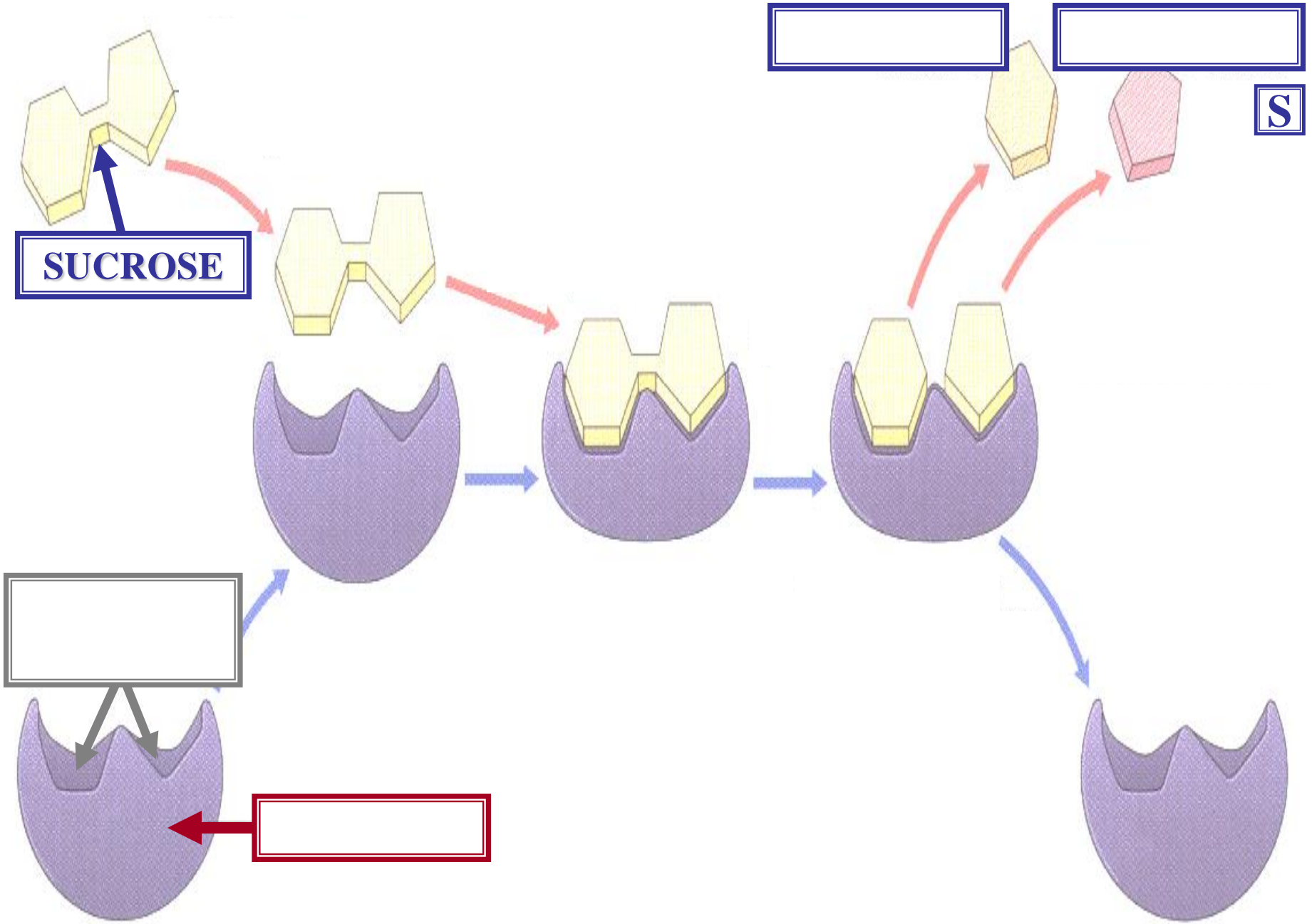
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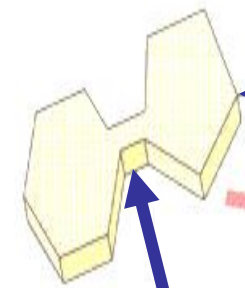
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SUGAR

SUCROSE

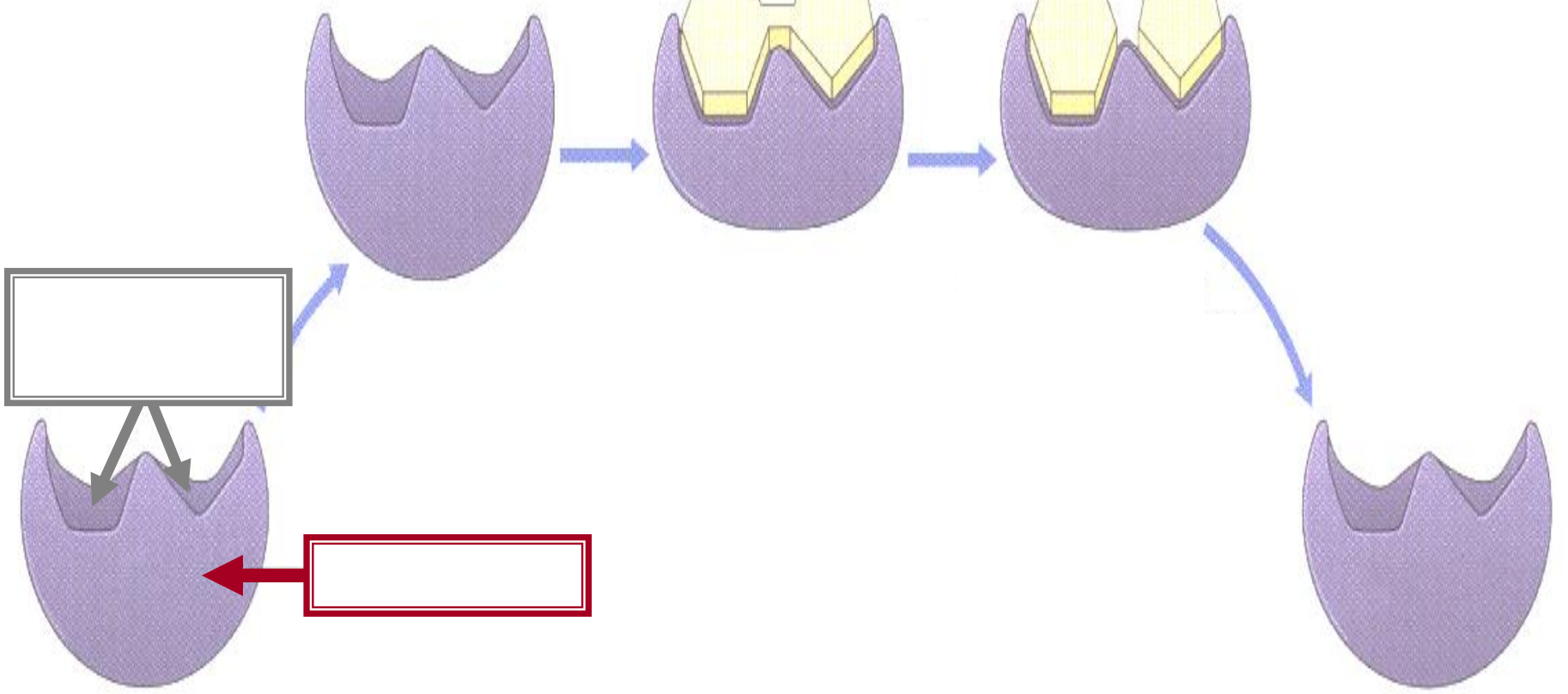
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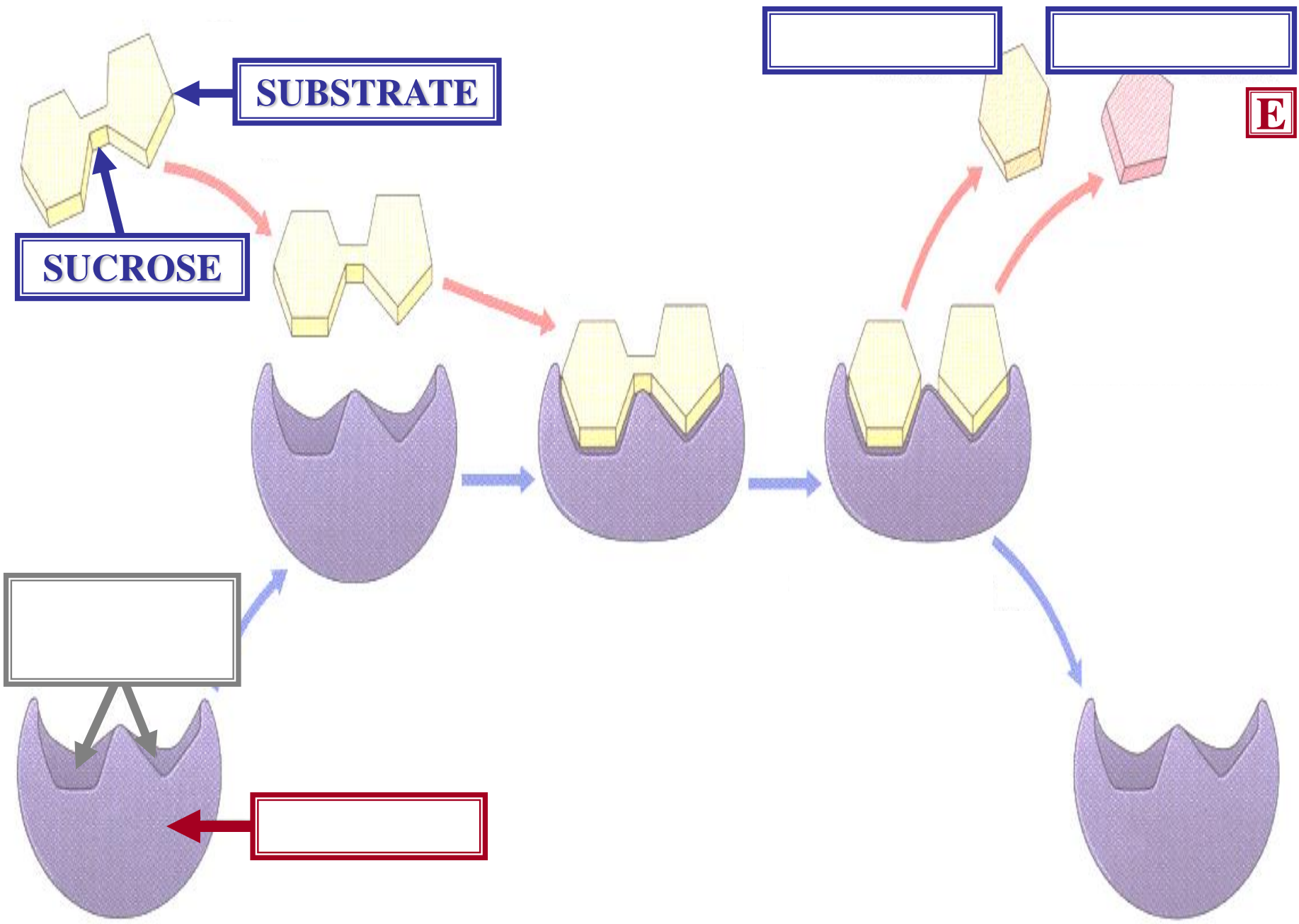
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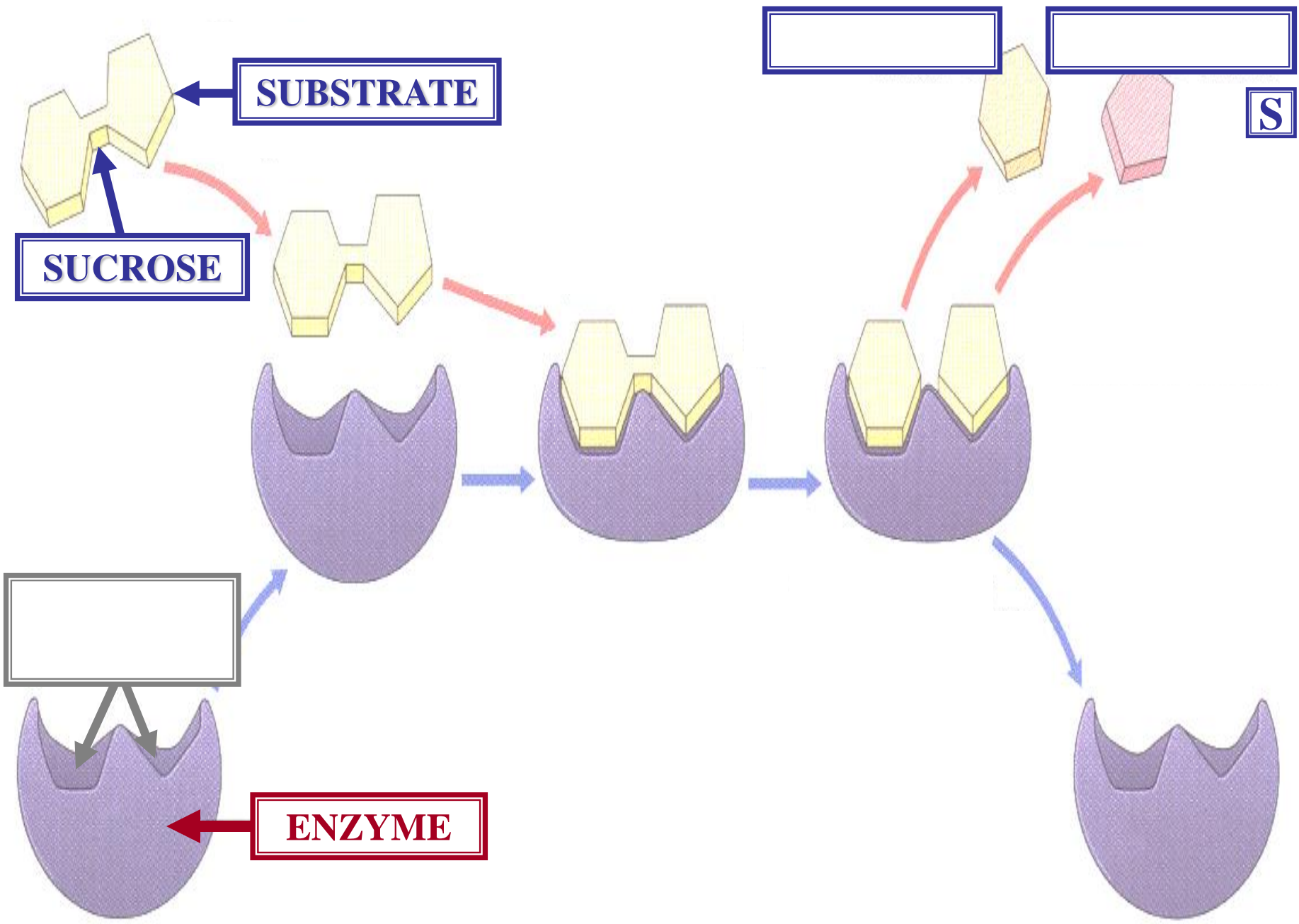
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SUBSTRATE

SUCROSE

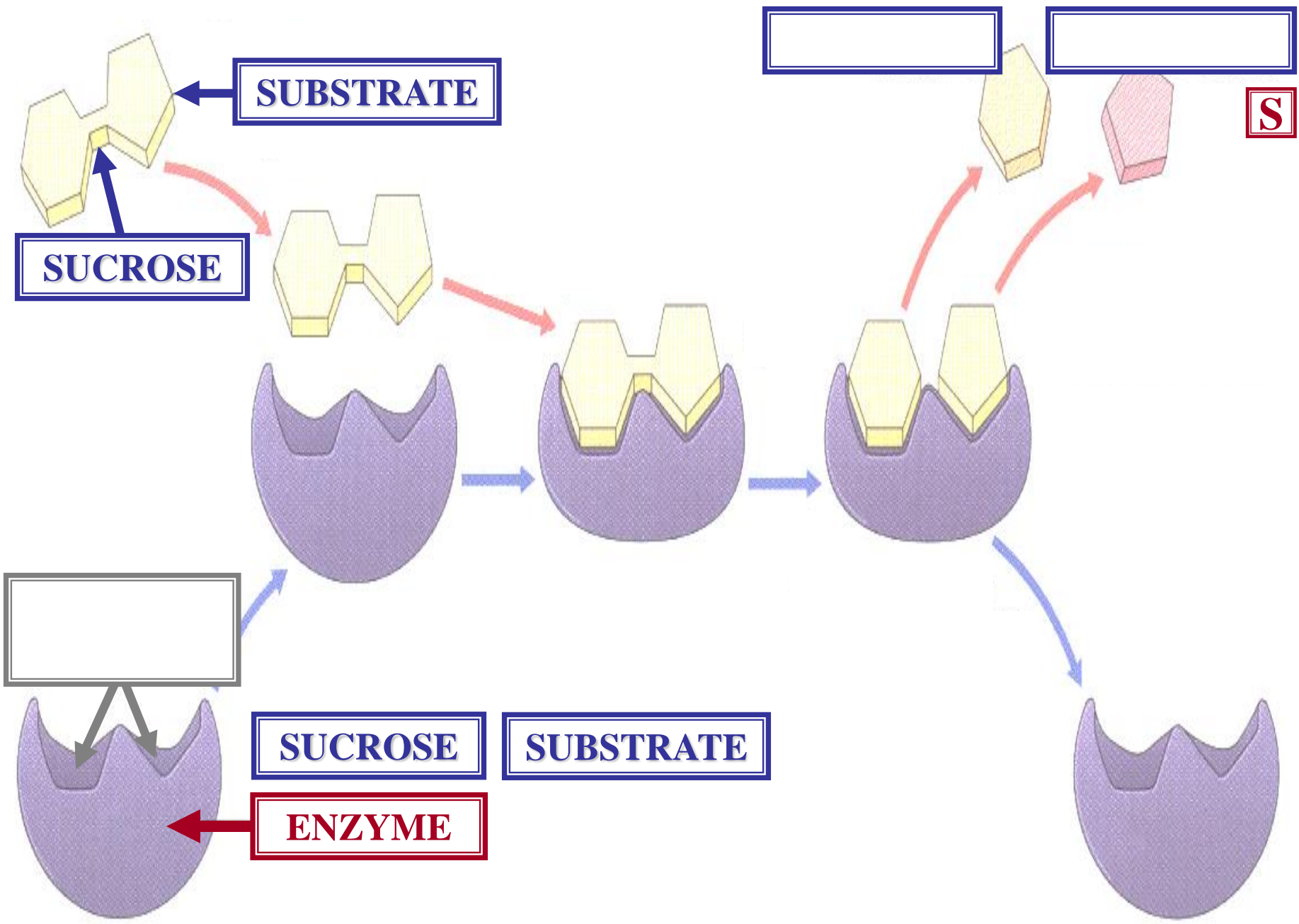
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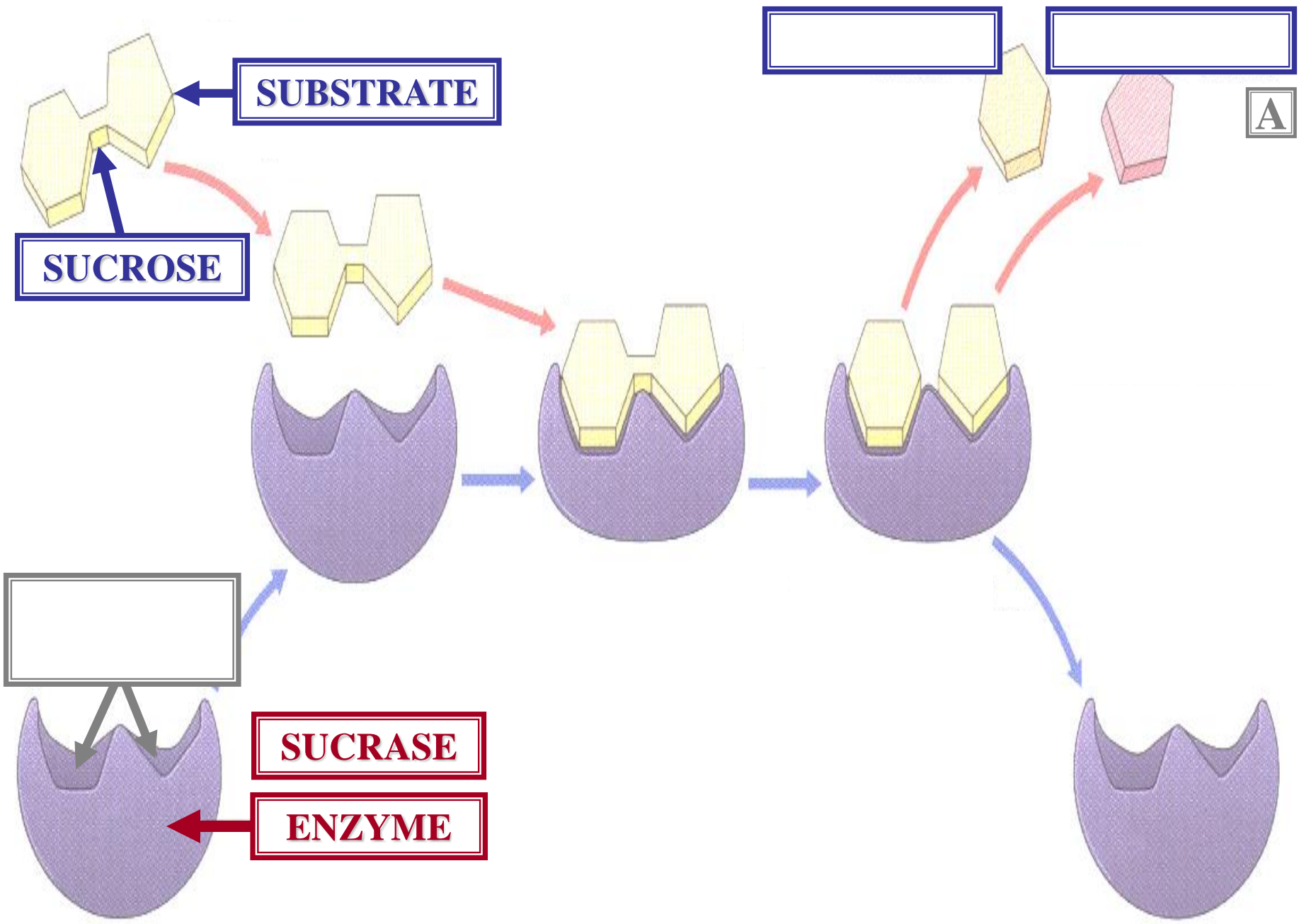
ENZYME

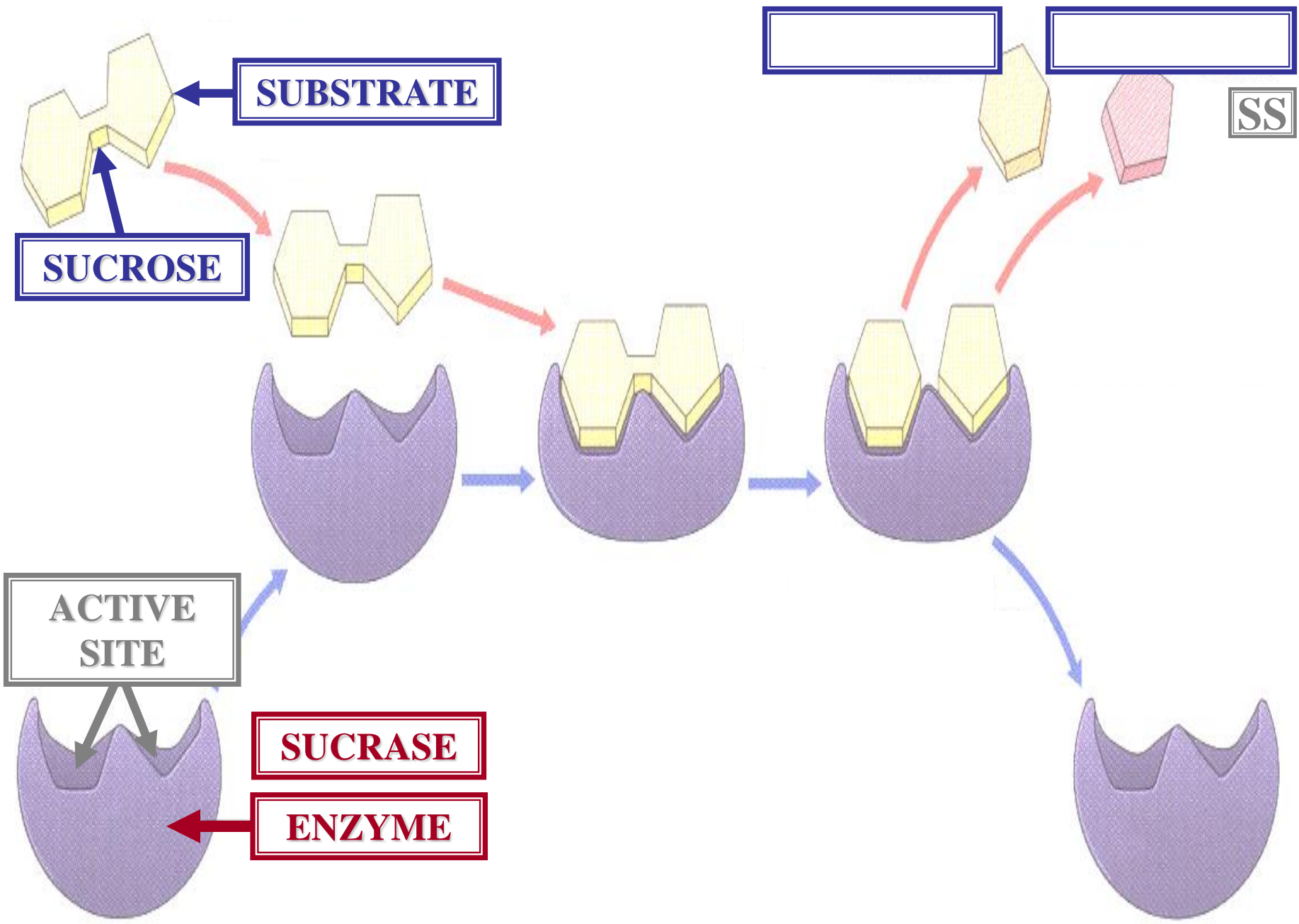
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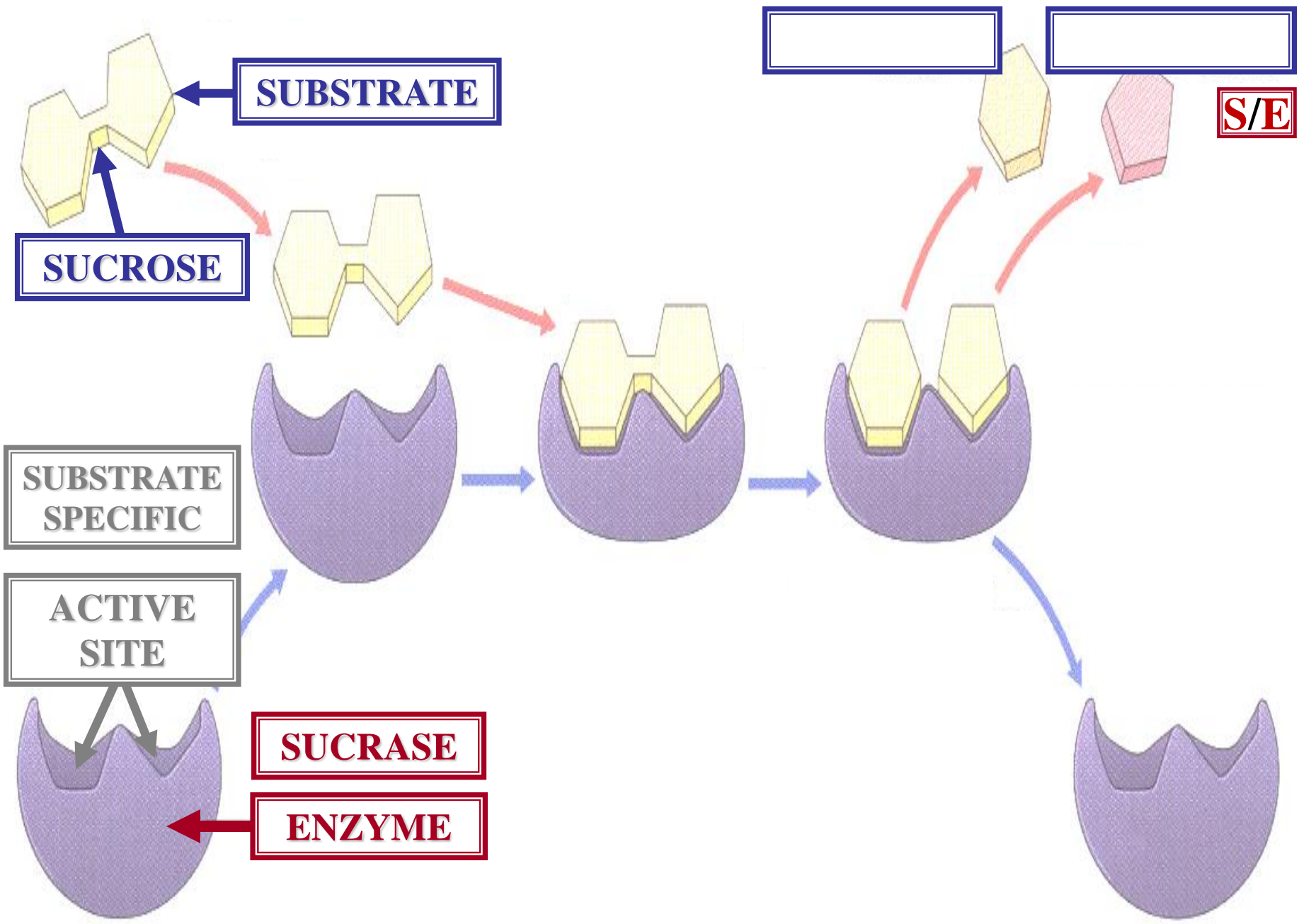
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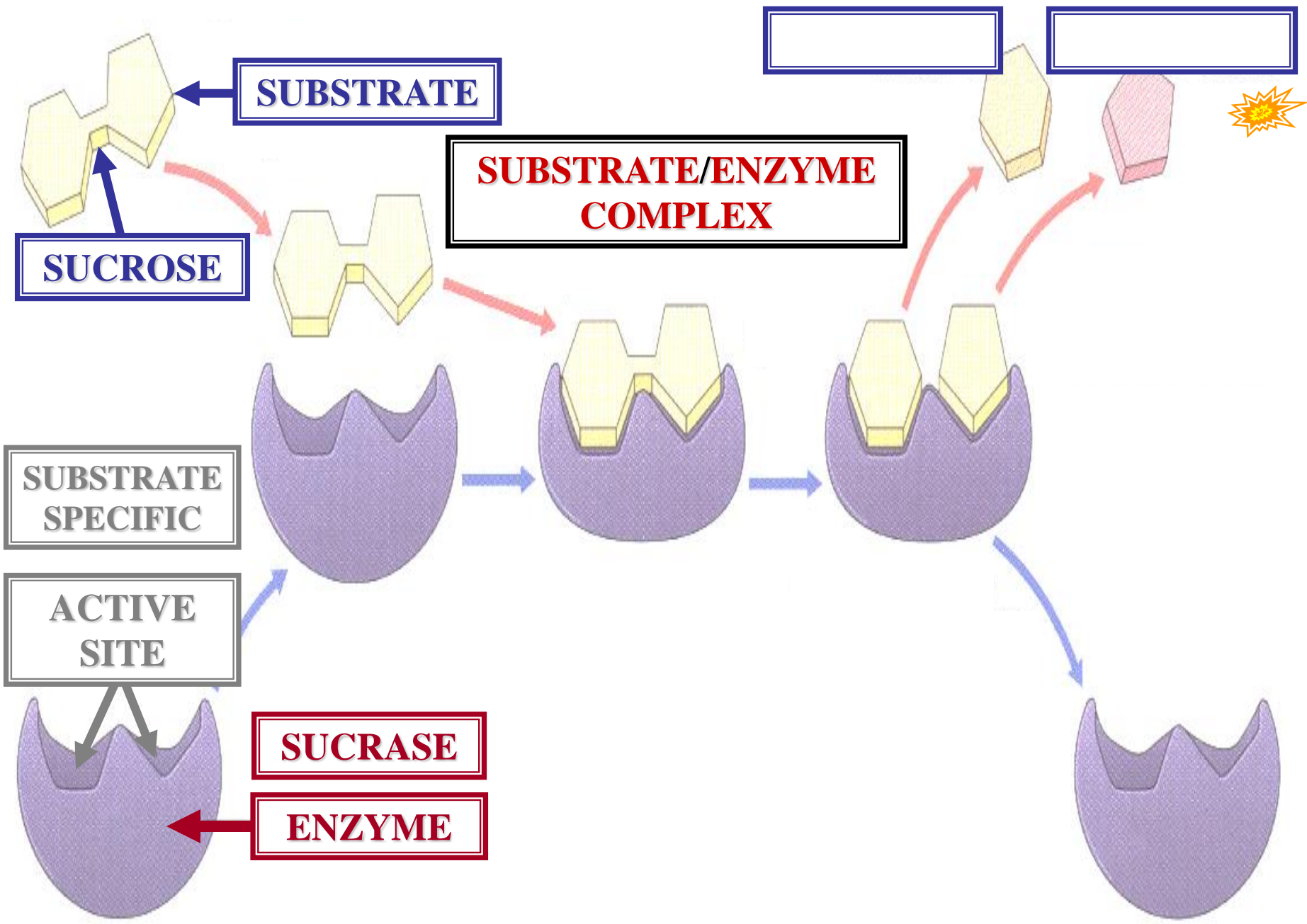
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SUBSTRATE

SUCROSE

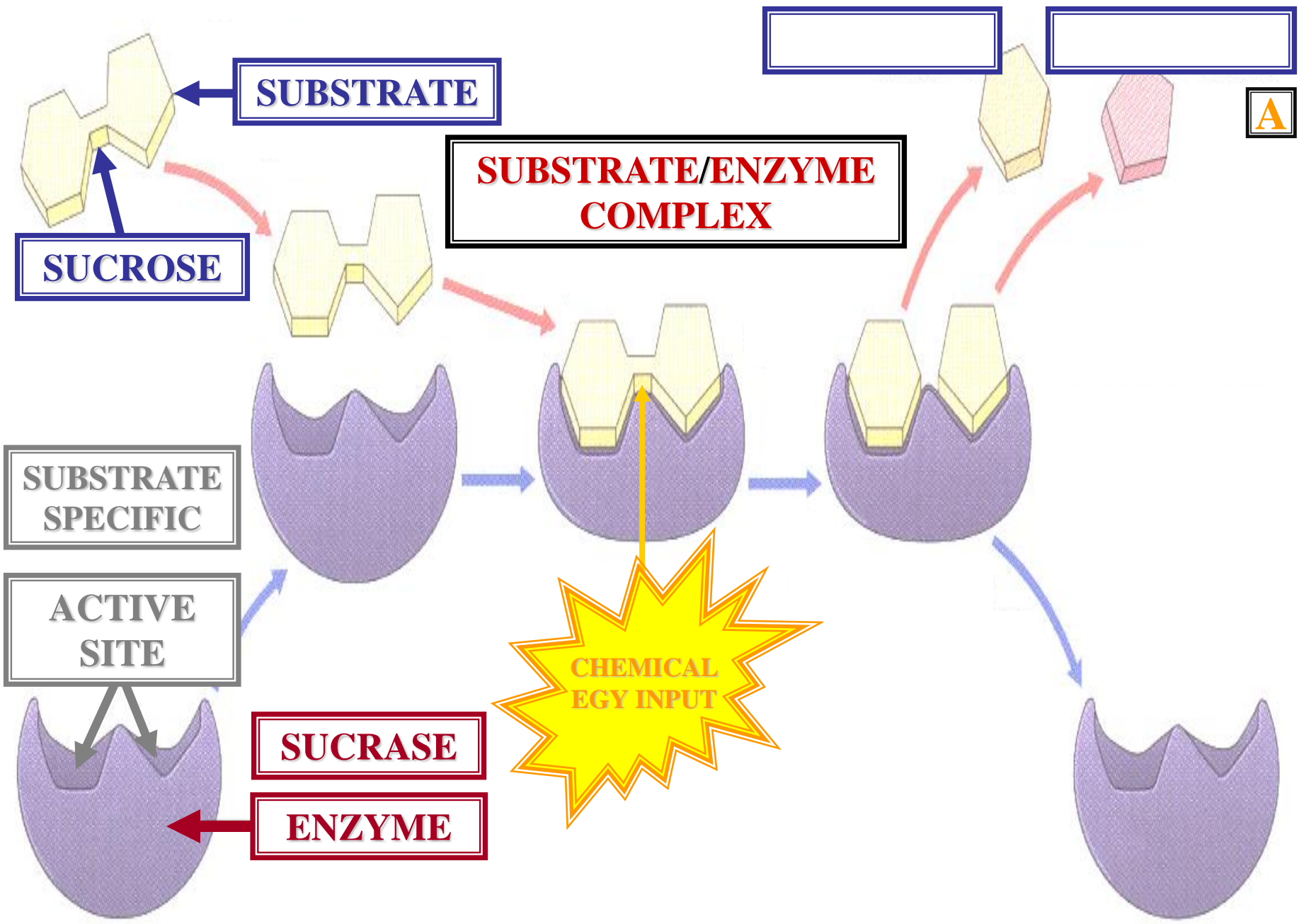
**SUBSTRATE/ENZYME
COMPLEX**

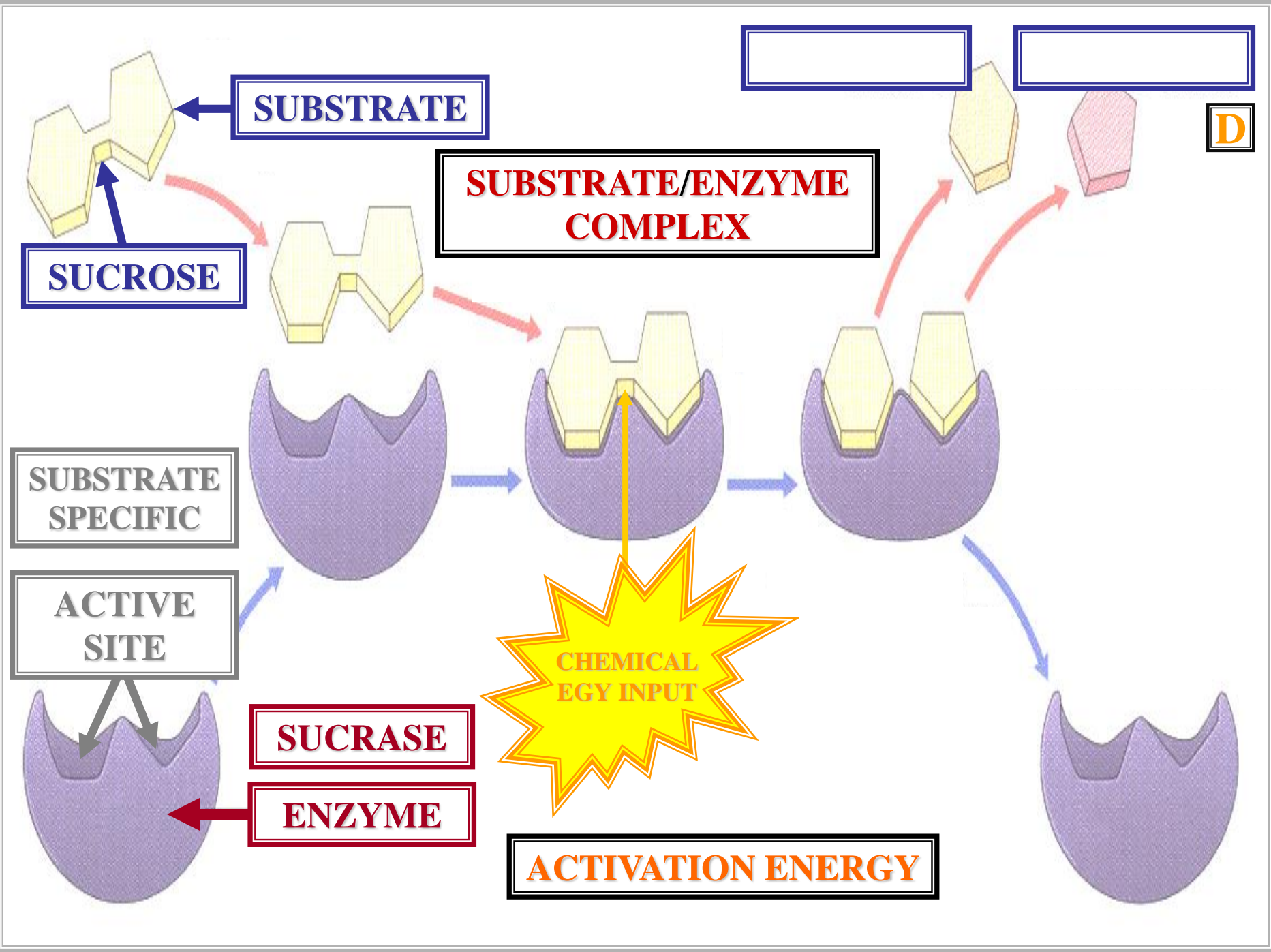
**SUBSTRATE
SPECIFIC**

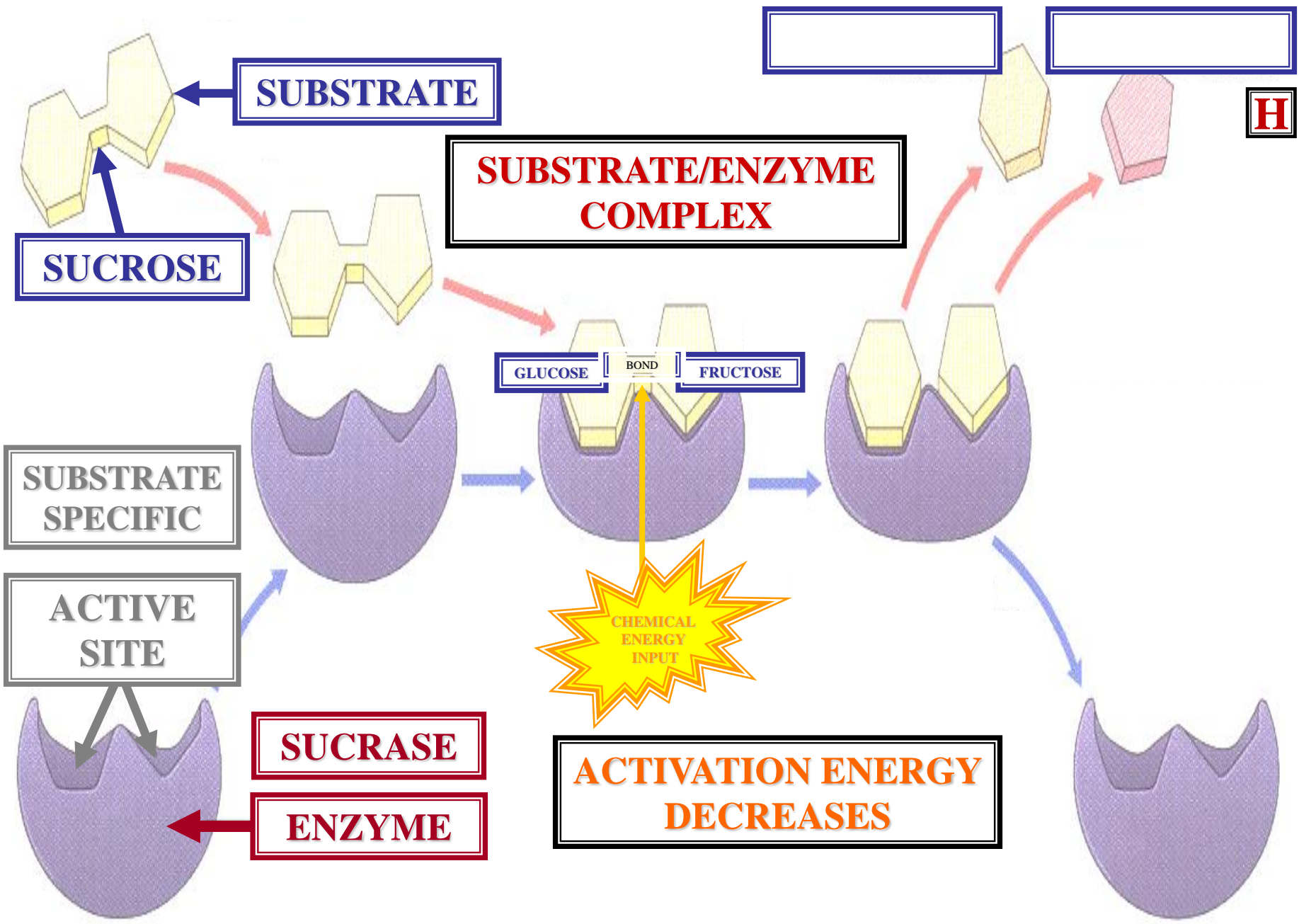
**ACTIVE
SITE**

SUCRASE

ENZYME







SUBSTRATE

SUCROSE

SUBSTRATE/ENZYME COMPLEX

GLUCOSE

BOND

FRUCTOSE

SUBSTRATE SPECIFIC

ACTIVE SITE

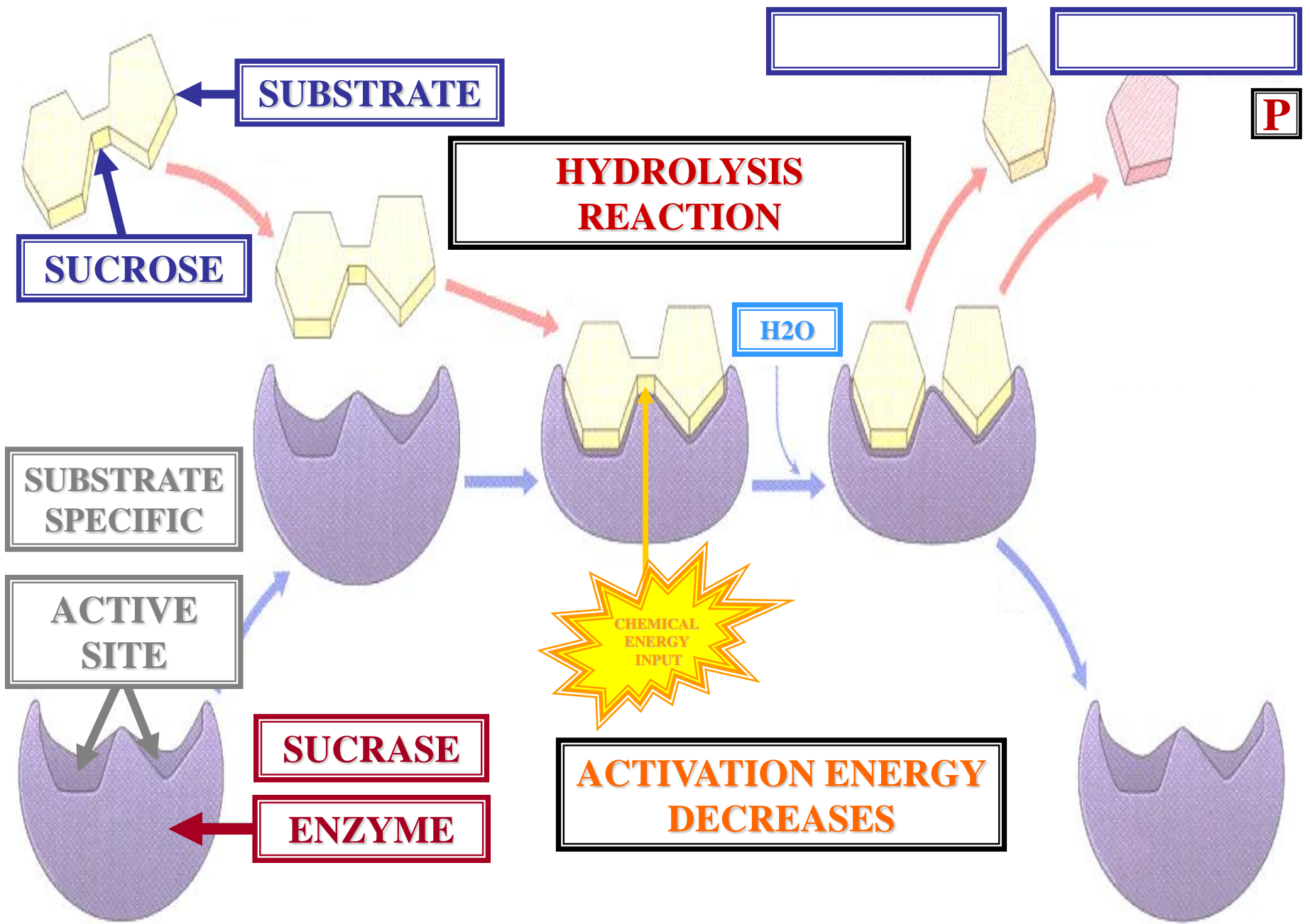
CHEMICAL ENERGY INPUT

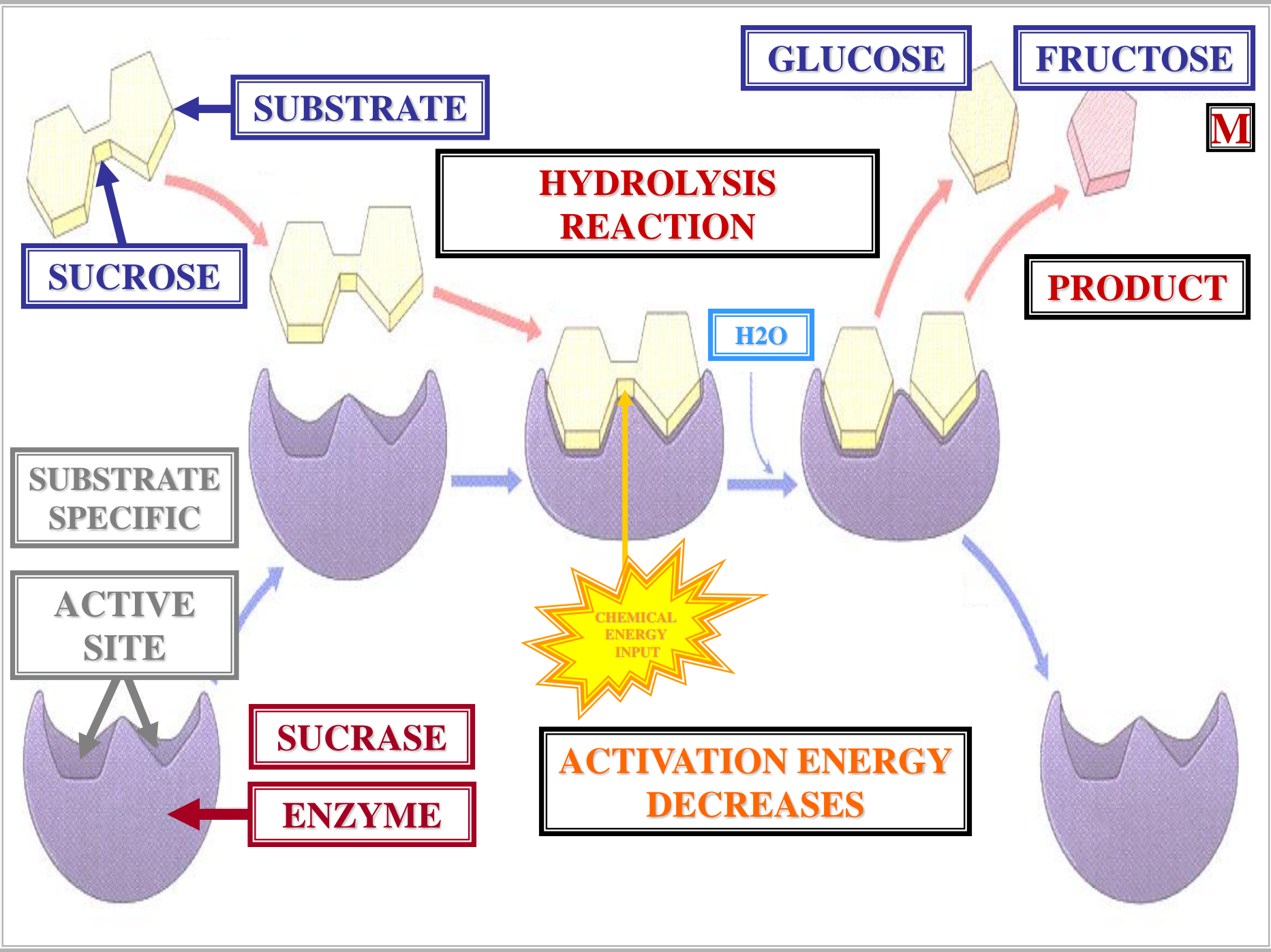
ACTIVATION ENERGY DECREASES

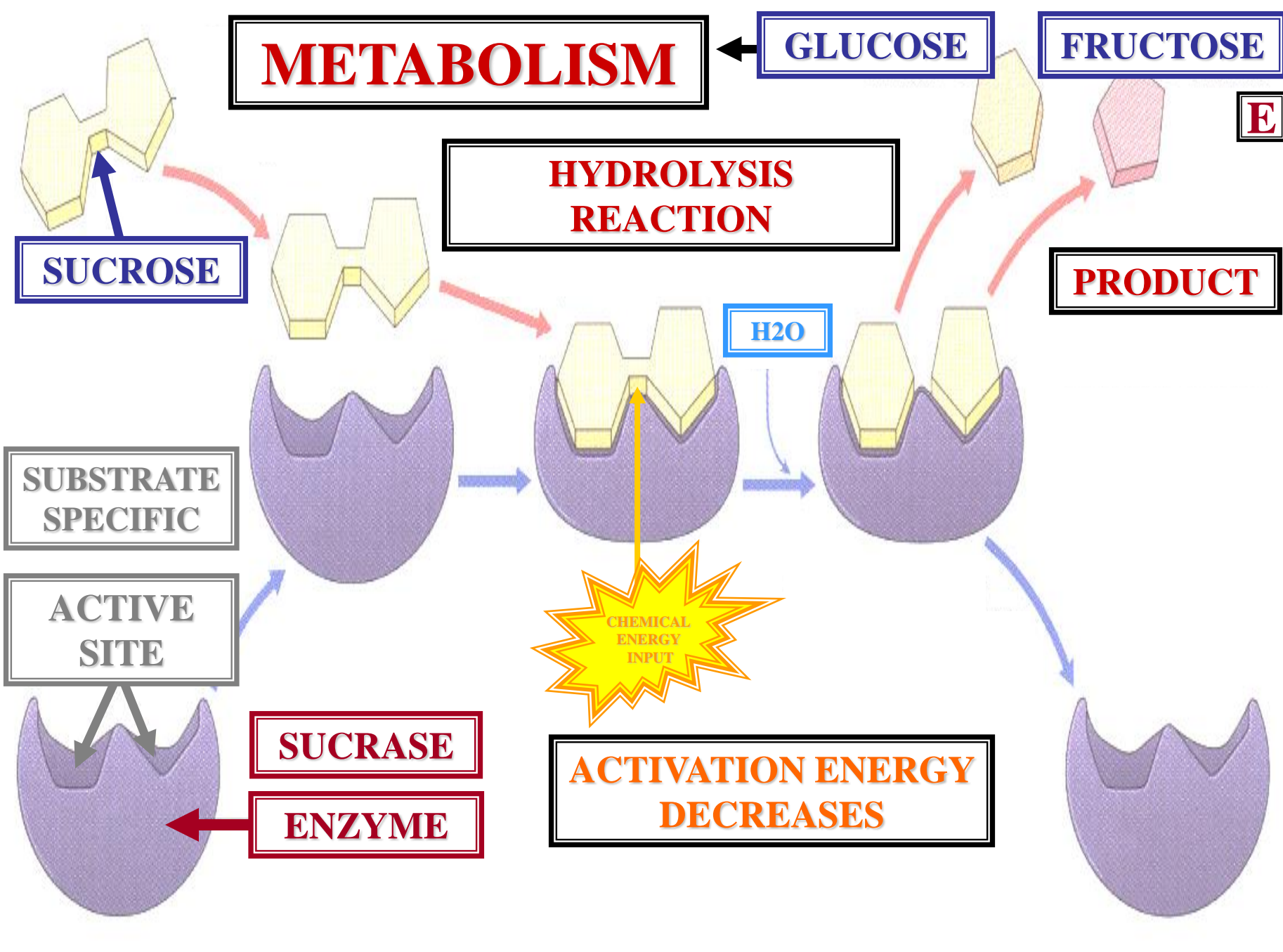
SUCRASE ENZYME

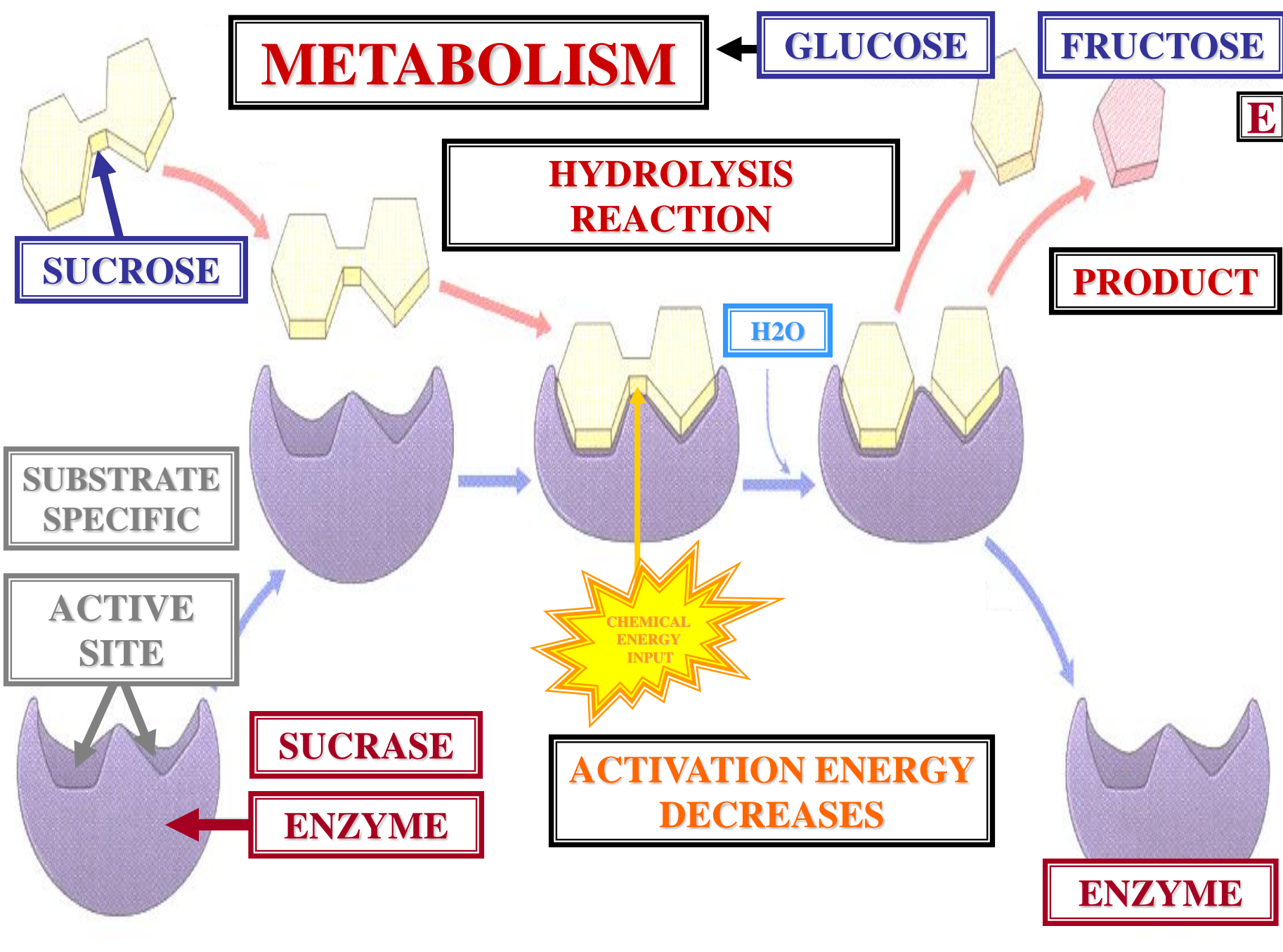
ENZYME

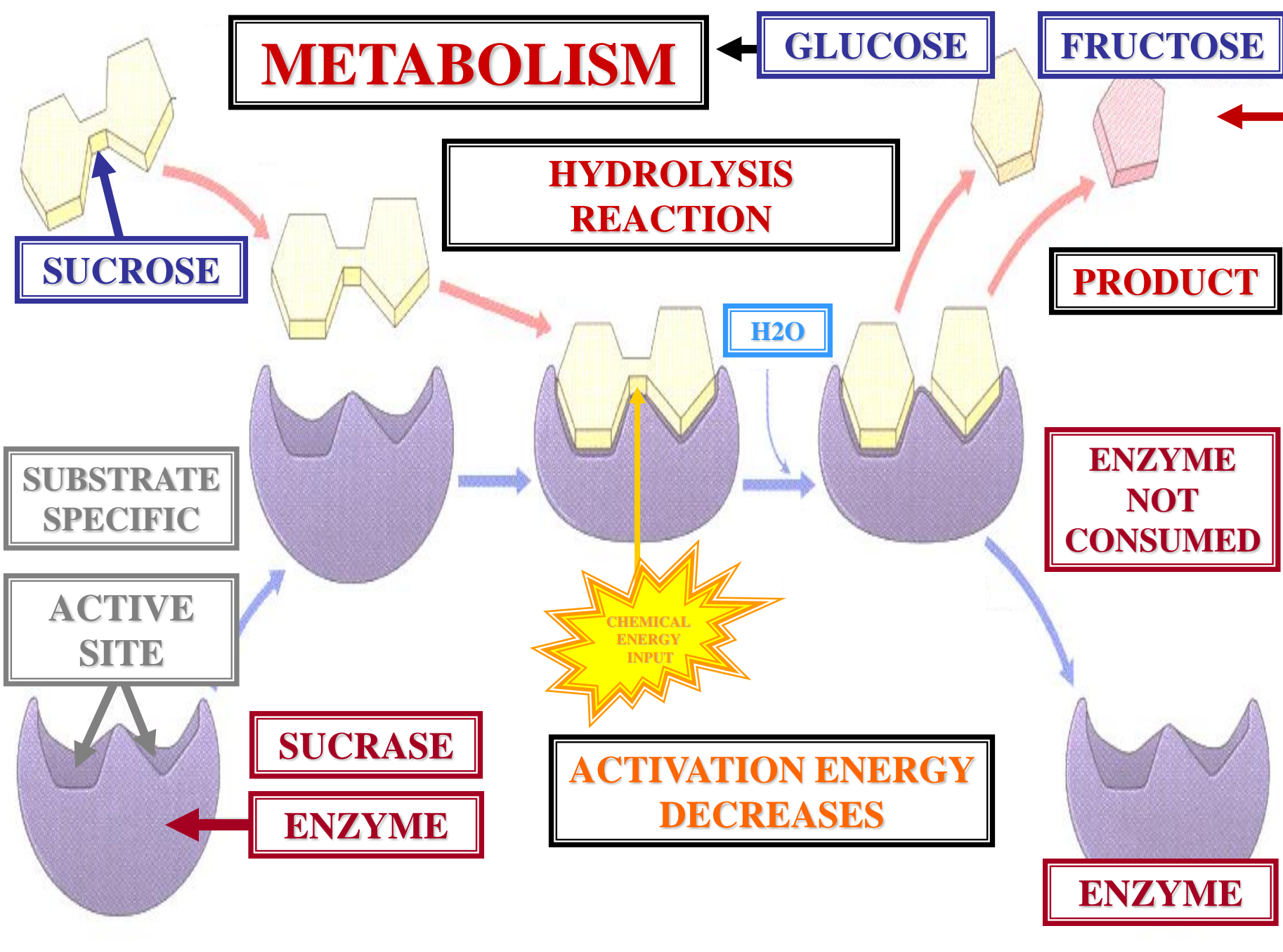
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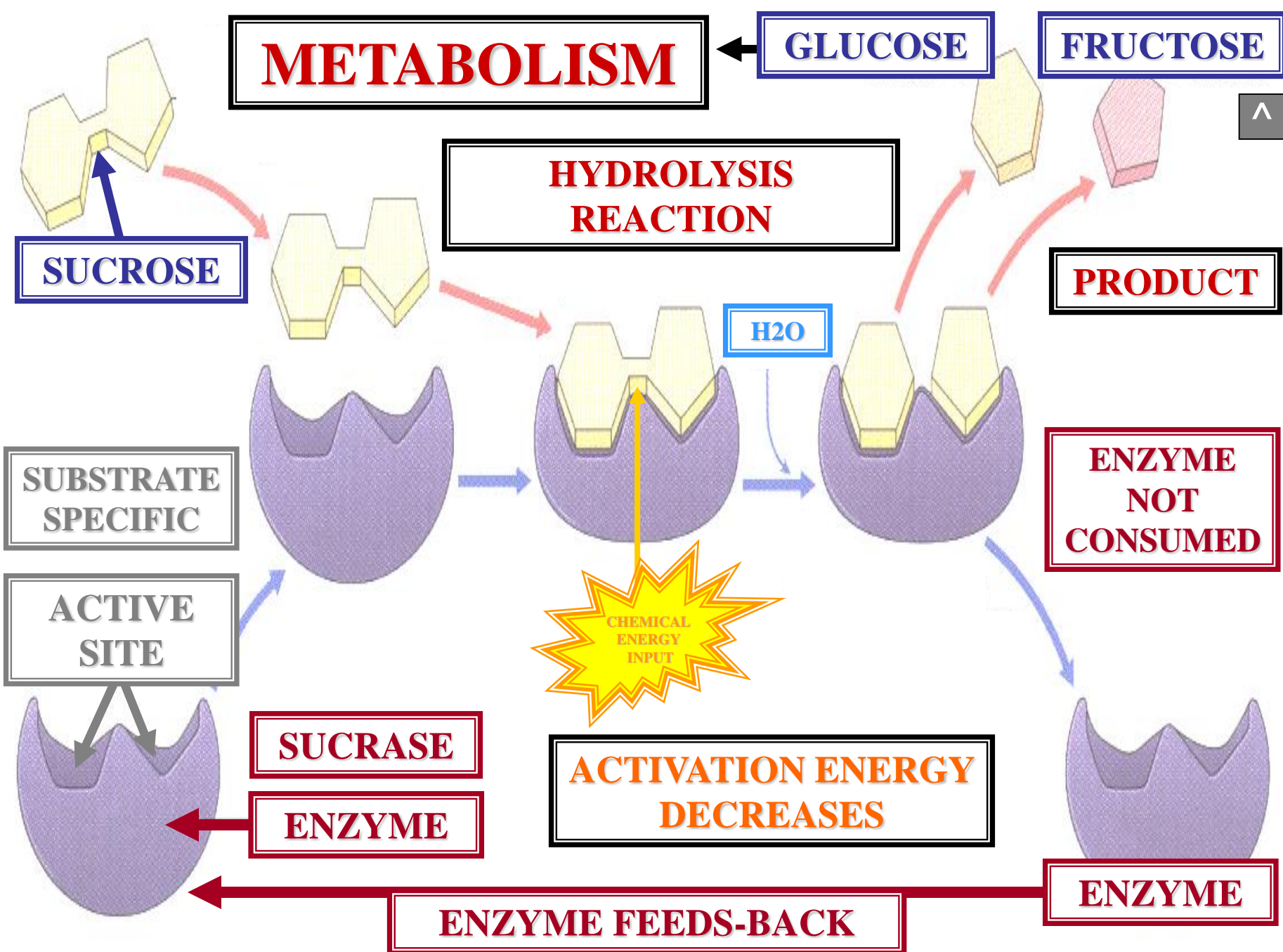












METABOLISM

GLUCOSE

FRUCTOSE

HYDROLYSIS REACTION

SUCROSE

PRODUCT

H₂O

SUBSTRATE SPECIFIC

ENZIME NOT CONSUMED

ACTIVE SITE

CHEMICAL ENERGY INPUT

ACTIVATION ENERGY DECREASES

SUCRASE ENZYME

ENZIME

ENZIME FEEDS-BACK

ENZYMIE DENATURES

ENZYME DENATURES

ENZYME DENATURES

**CONFORMATION
CHANGE**

ENZYME DENATURES

**ENZYME
CONFORMATION**

ENZYME CONFORMATION

ENZYME
STRUCTURE / SHAPE

ENZYME CONFORMATION

ENZYME CONFORMATION



DIFFERENT ENZYMES

ENZYME CONFORMATION



DIFFERENT STRUCTURE

ENZYME CONFORMATION



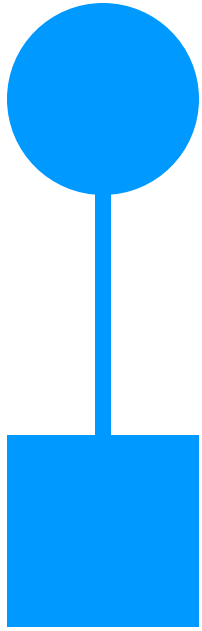
DIFFERENT CONFORMATION

ENZYME CONFORMATION

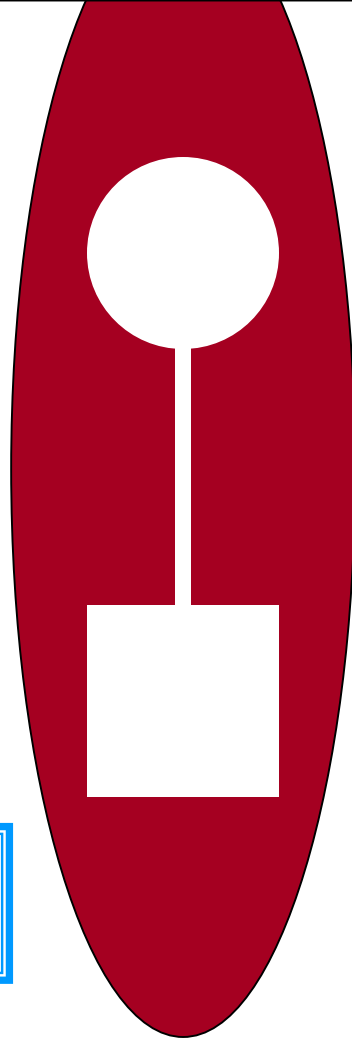


DIFFERENT FUNCTION

ENZYZME DENATURES



SUBSTRATE



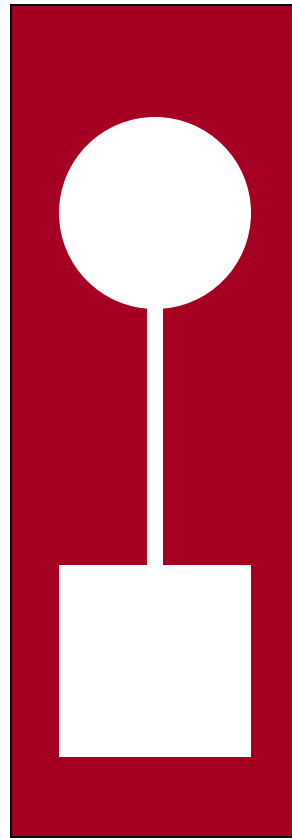
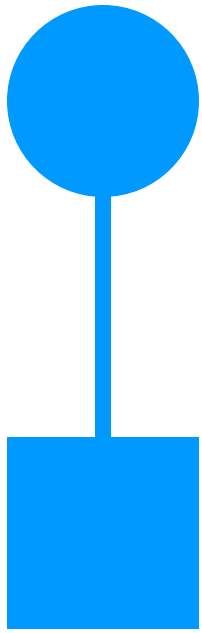
ENZYZME

**ACTIVE
SITE**

ENZYZME CONFORMATION

ENZYLE DENATURES

AS



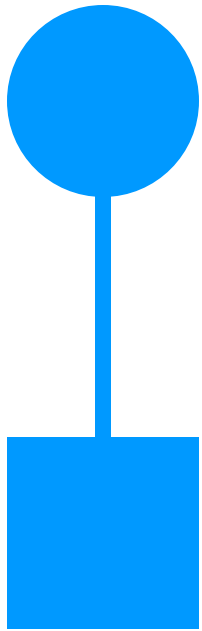
ACTIVE
SITE

SUBSTRATE

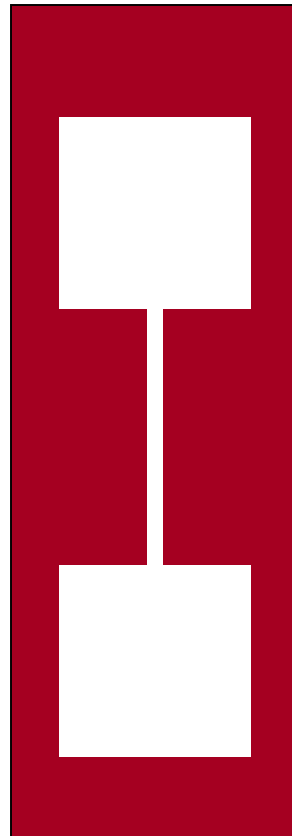
CHANGE ENZYME CONFORMATION

ENZYLE

ENZYME DENATURES



SUBSTRATE



**ACTIVE
SITE**

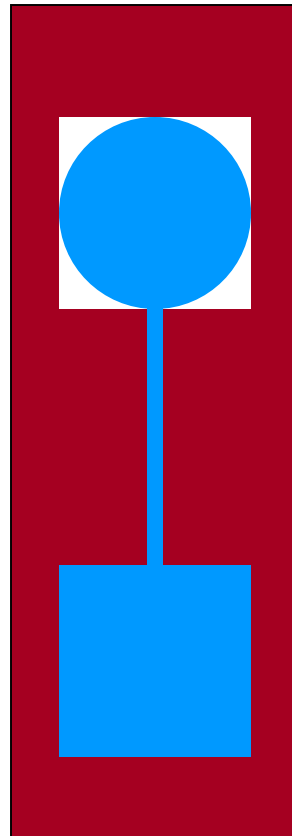
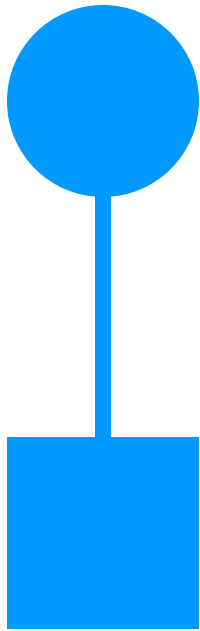
CHANGE ACTIVE SITE CONFORMATION

ENZYME



ENZYME DENATURES

N



ACTIVE
SITE

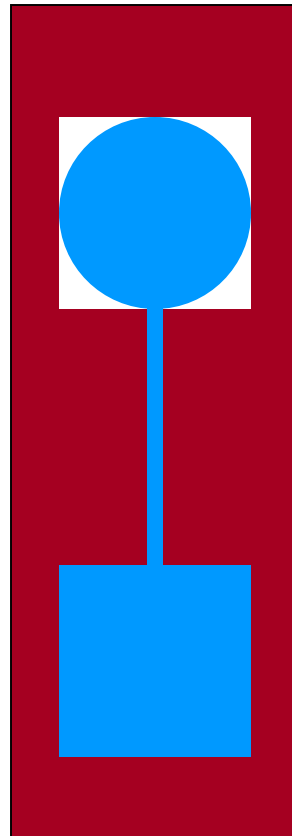
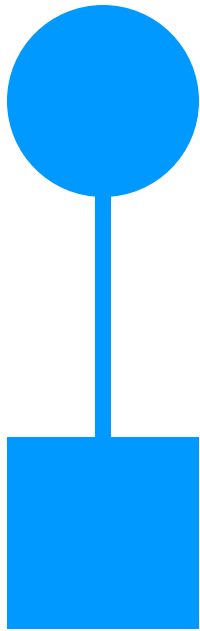
SUBSTRATE

CHANGE ACTIVE SITE CONFORMATION

ENZYME

ENZYME DENATURES

N



NO SUB/ENZ
INTERACTION

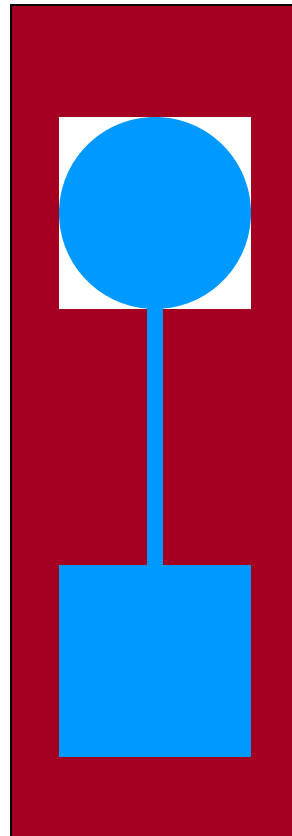
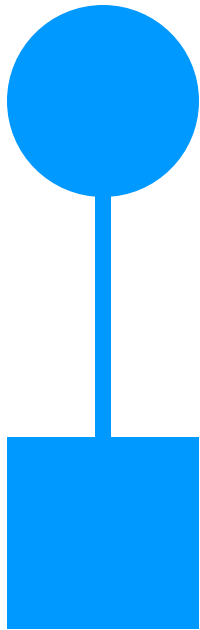
SUBSTRATE

CHANGE ACTIVE SITE CONFORMATION

ENZYME

ENZYME DENATURES

L



NO
PRODUCT
OUTPUT

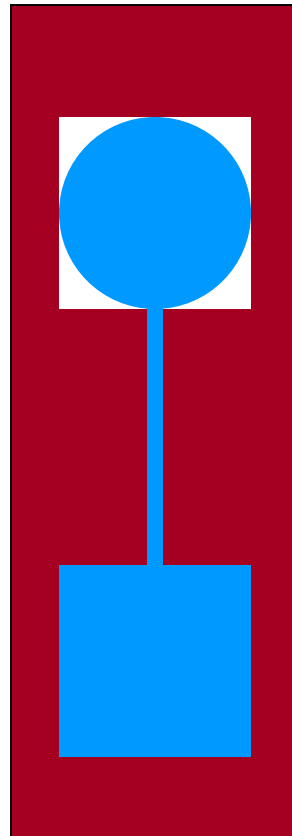
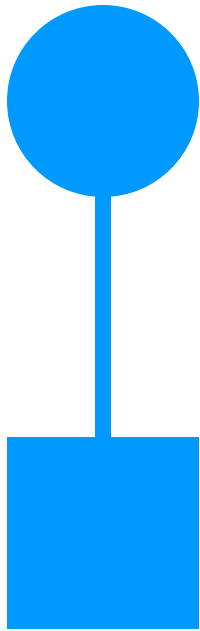
SUBSTRATE

CHANGE ACTIVE SITE CONFORMATION

ENZYME

ENZYZME DENATURES

E



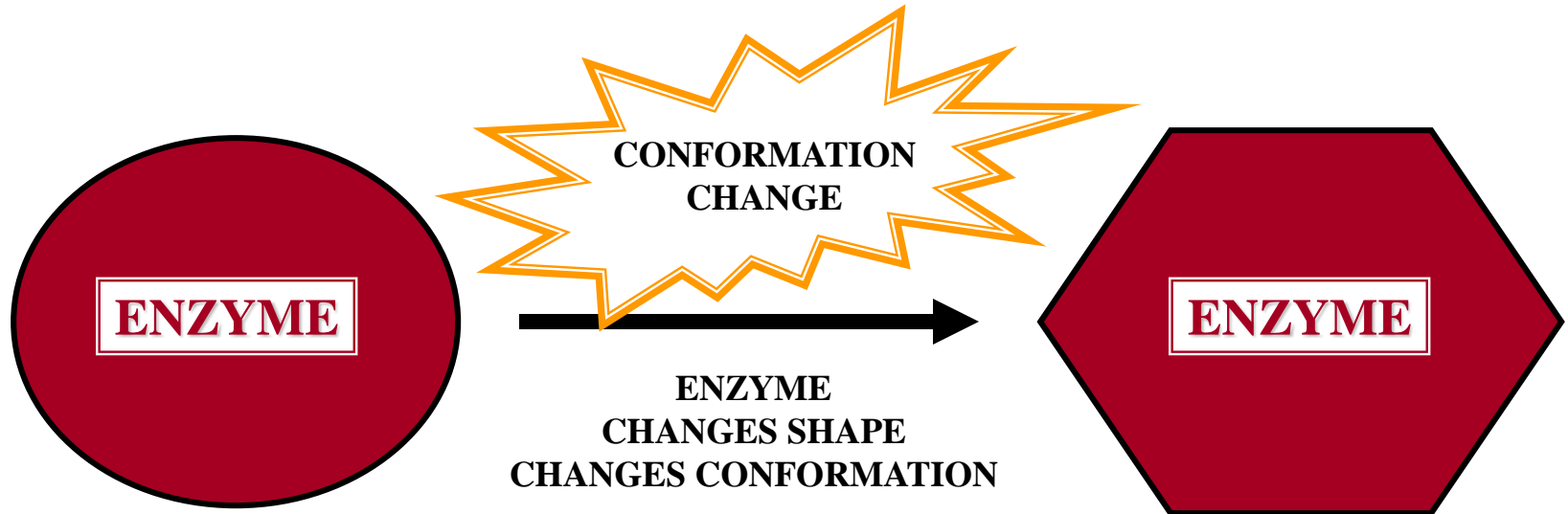
**LOST
ENZYZME
FUNCTION**

SUBSTRATE

CHANGE ACTIVE SITE CONFORMATION

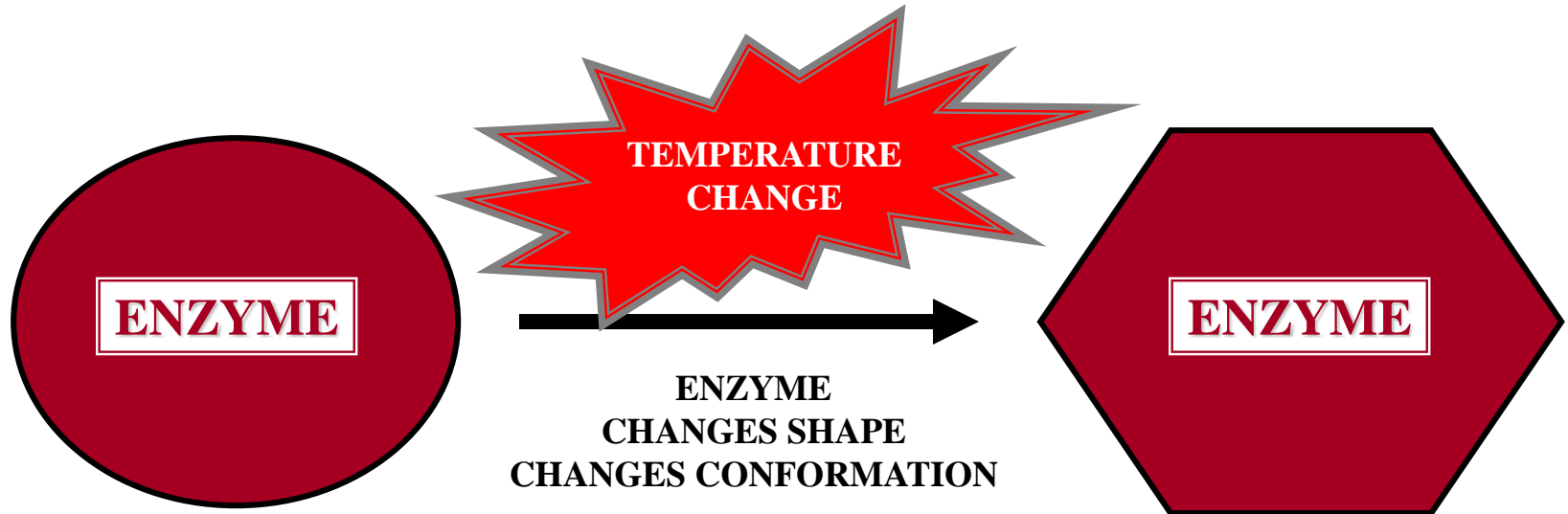
ENZYZME

ENZYME DENATURES



ENZYMES SENSITIVE:

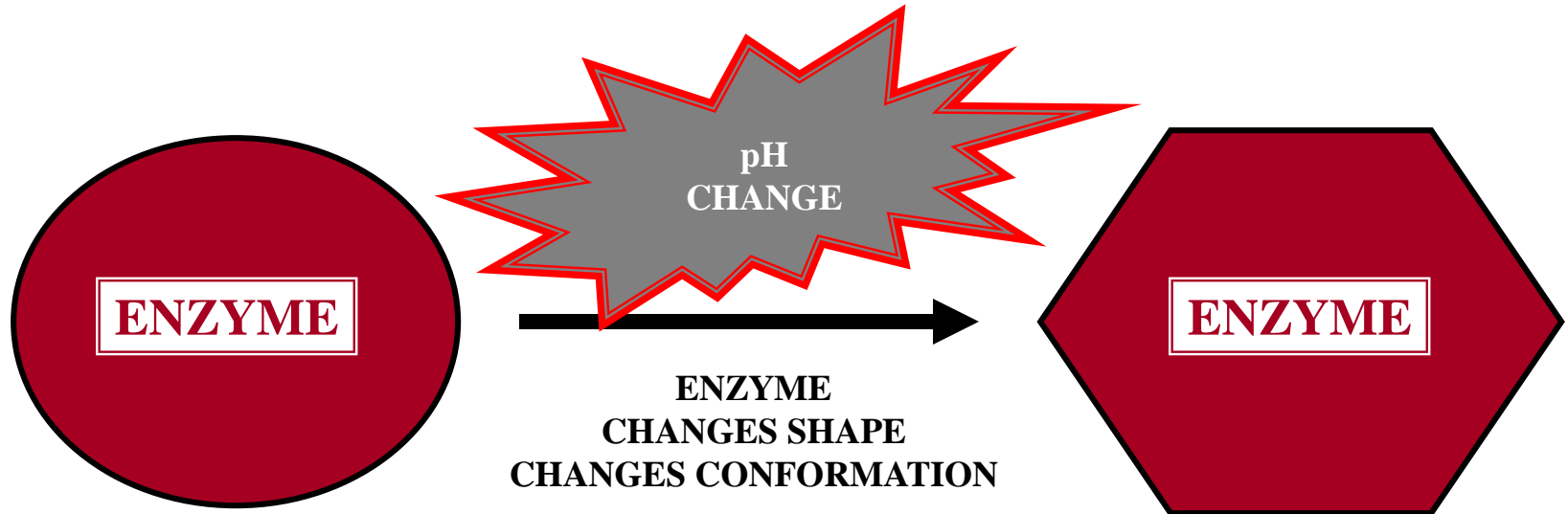
ENZYME DENATURES




**ENZYMES SENSITIVE:
TEMPERATURE CHANGE**



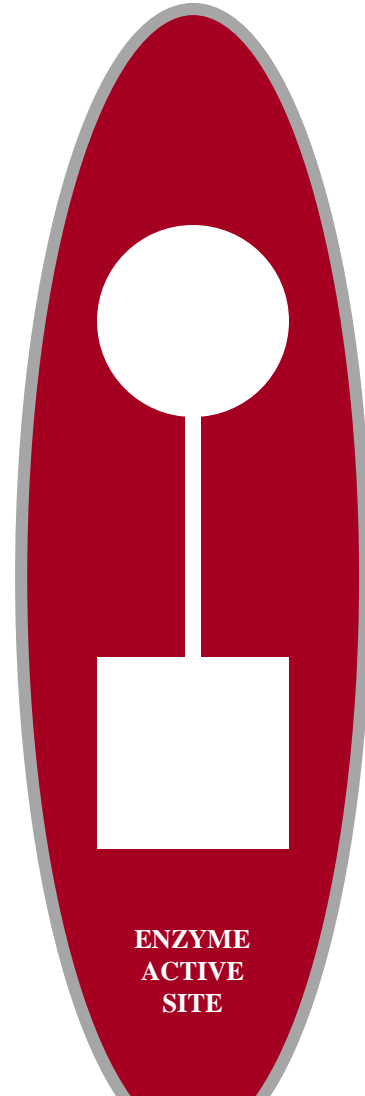
ENZYME DENATURES



ENZYMES SENSITIVE:
pH CHANGE

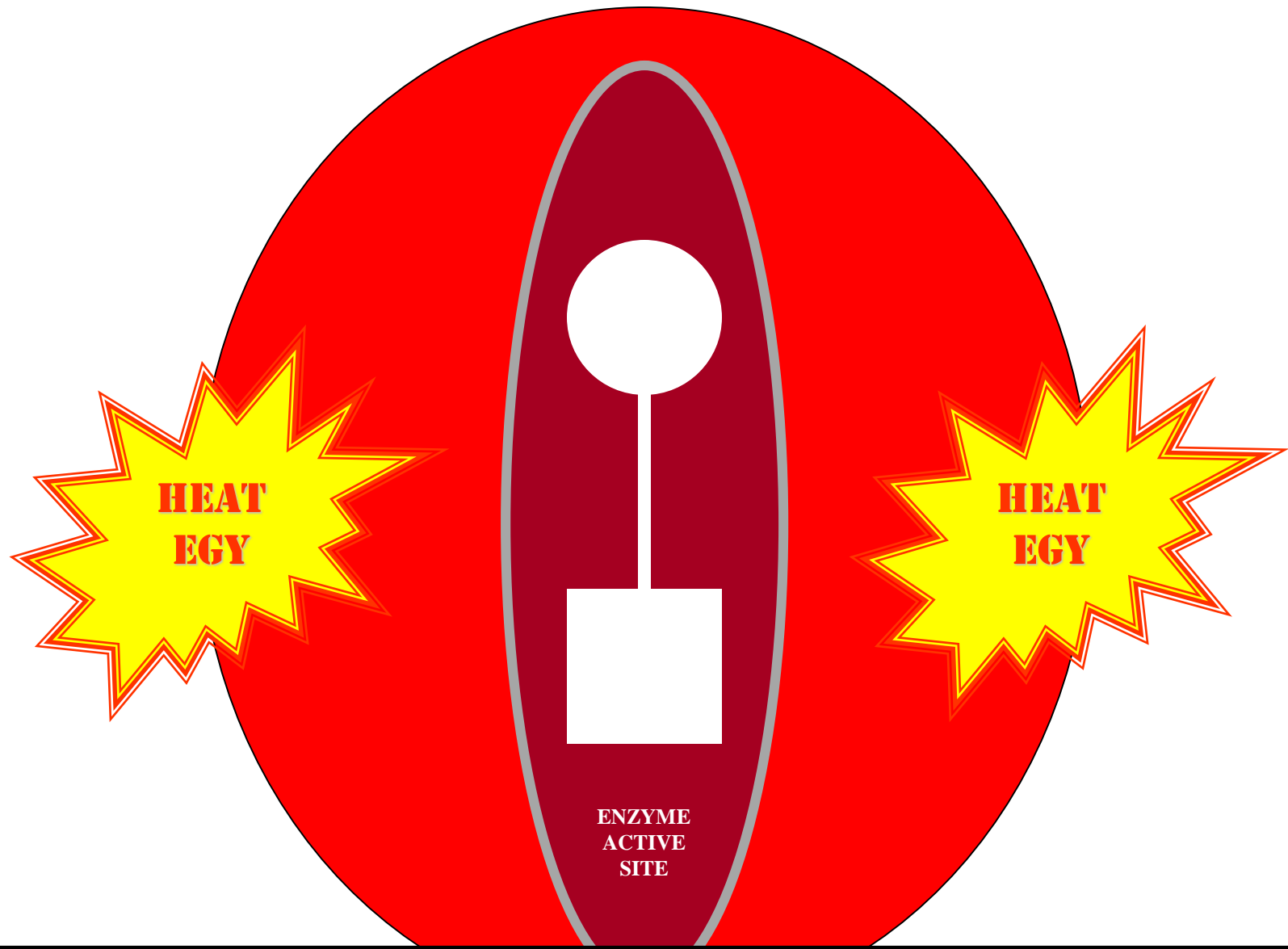


**ENZYME
DENATURES
TEMPERATURE
CHANGE**

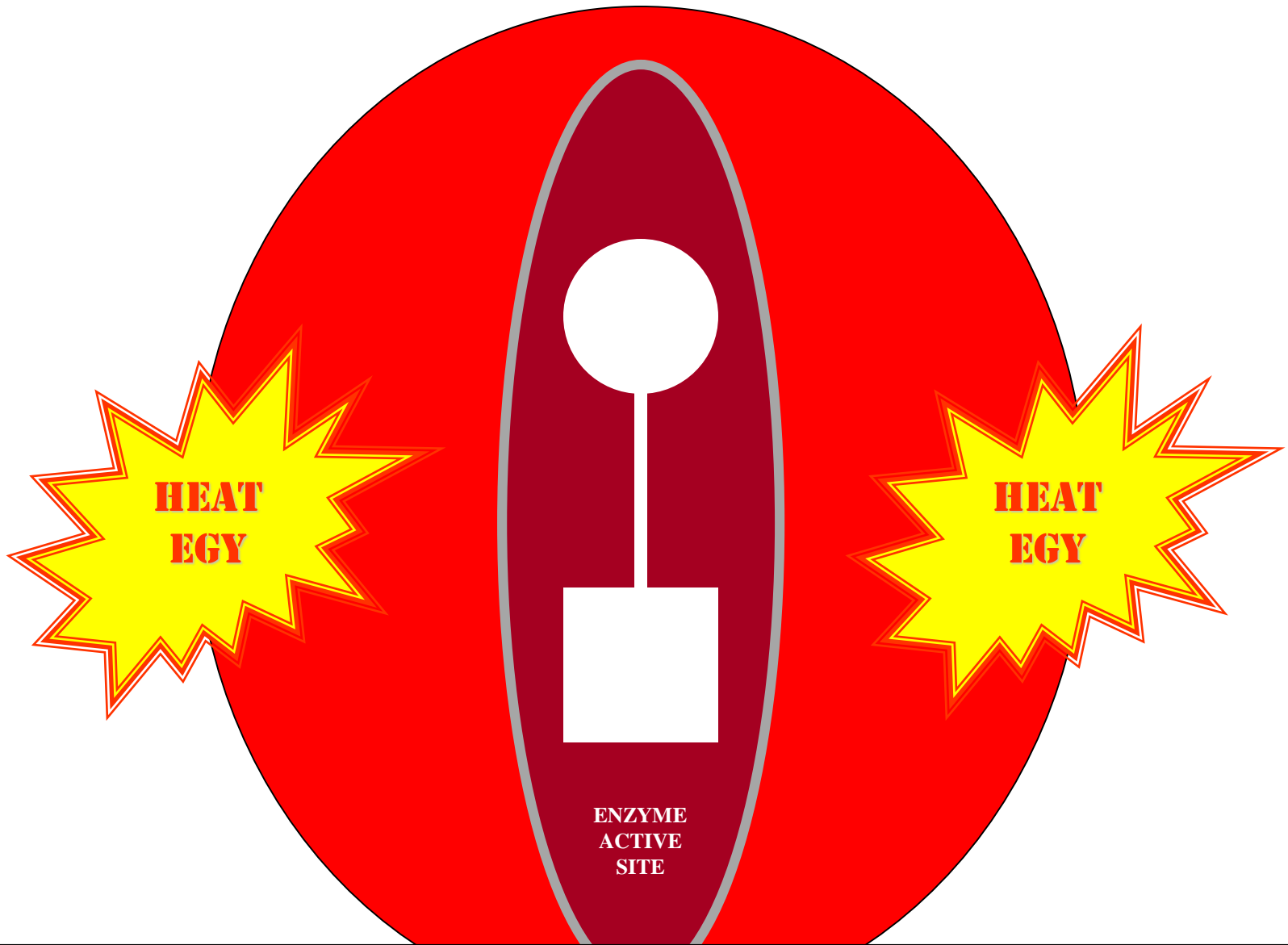


ENZYME
ACTIVE
SITE

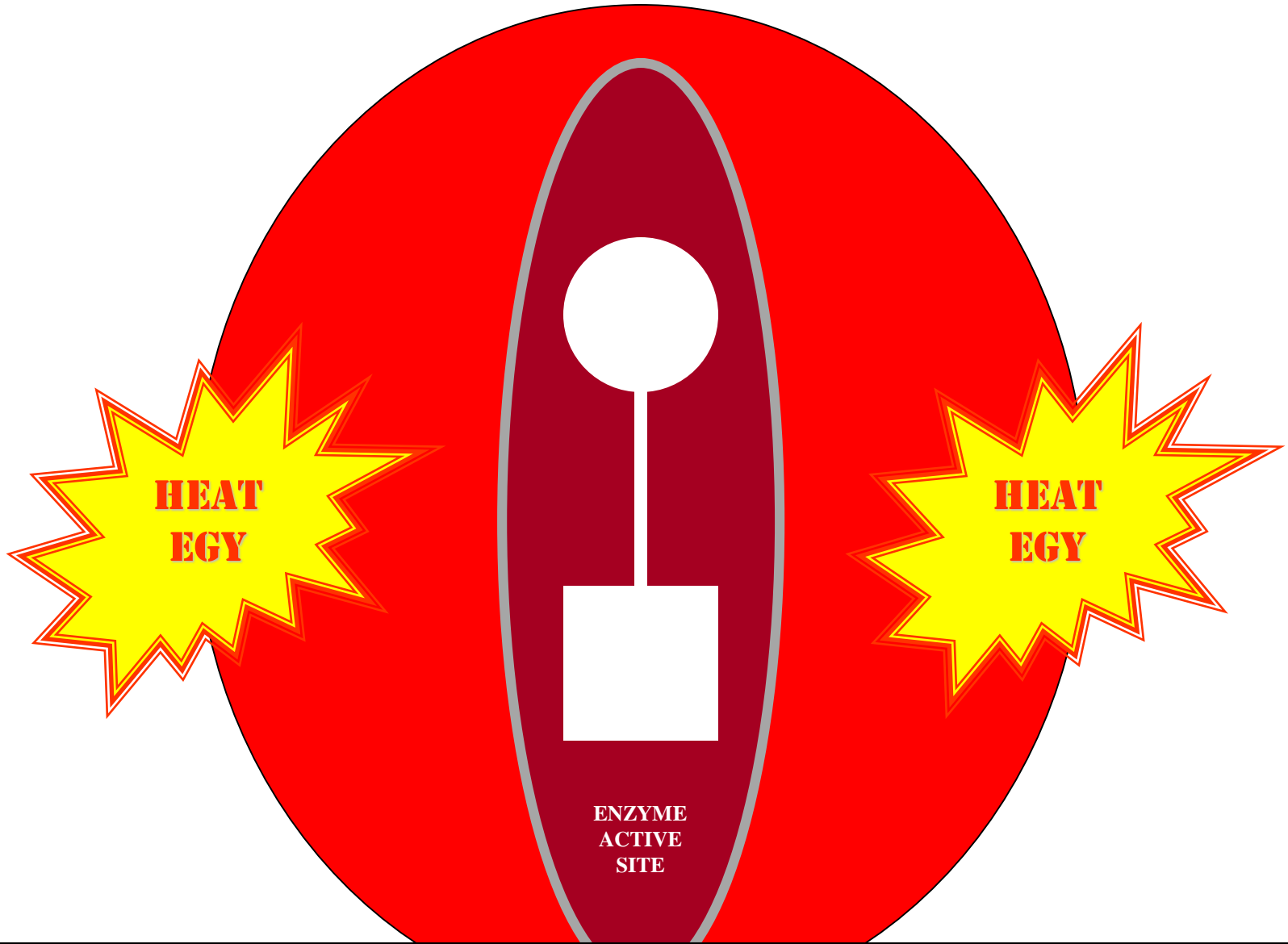
ENZYME



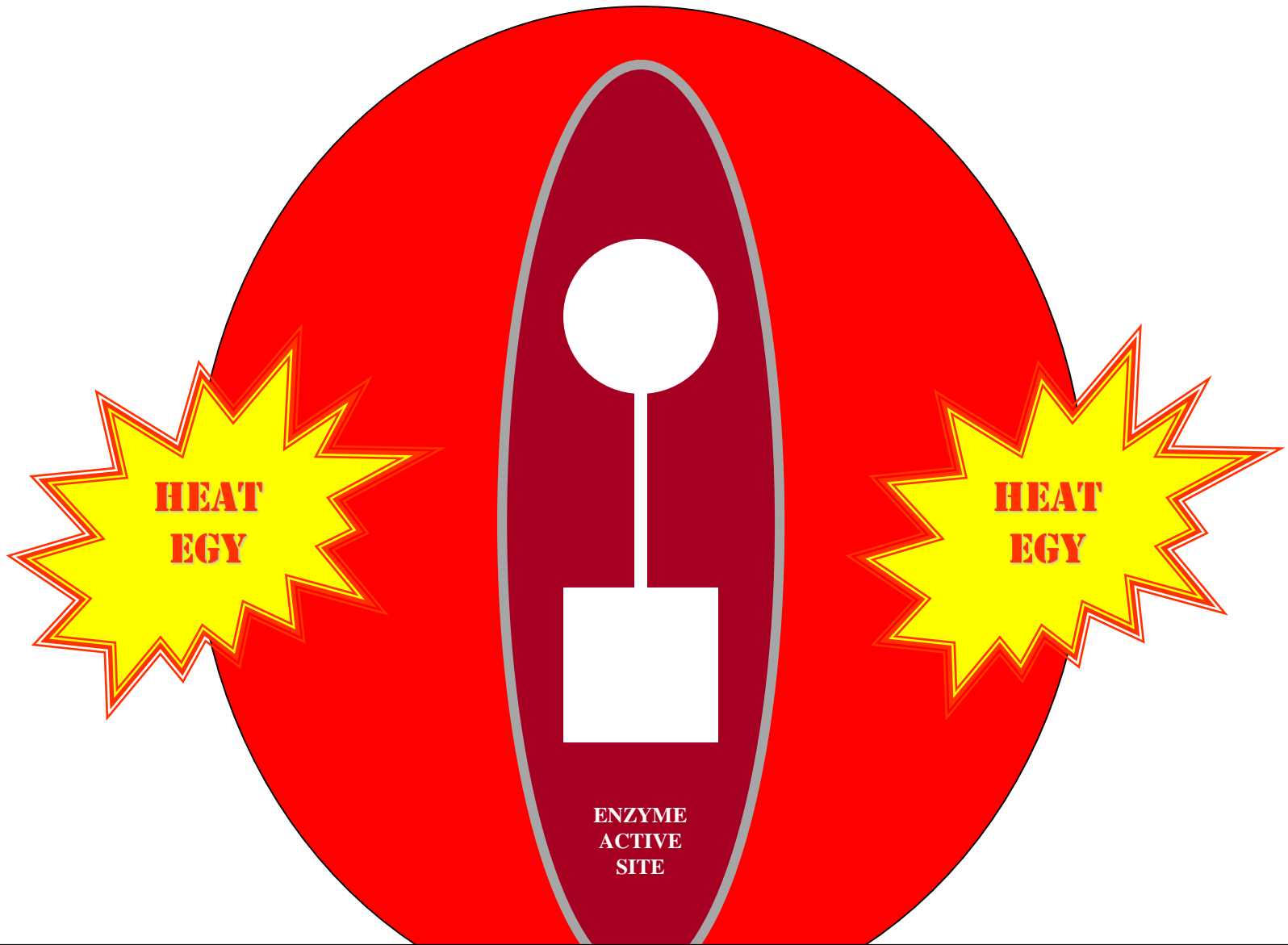
TEMPERATURE INCREASE



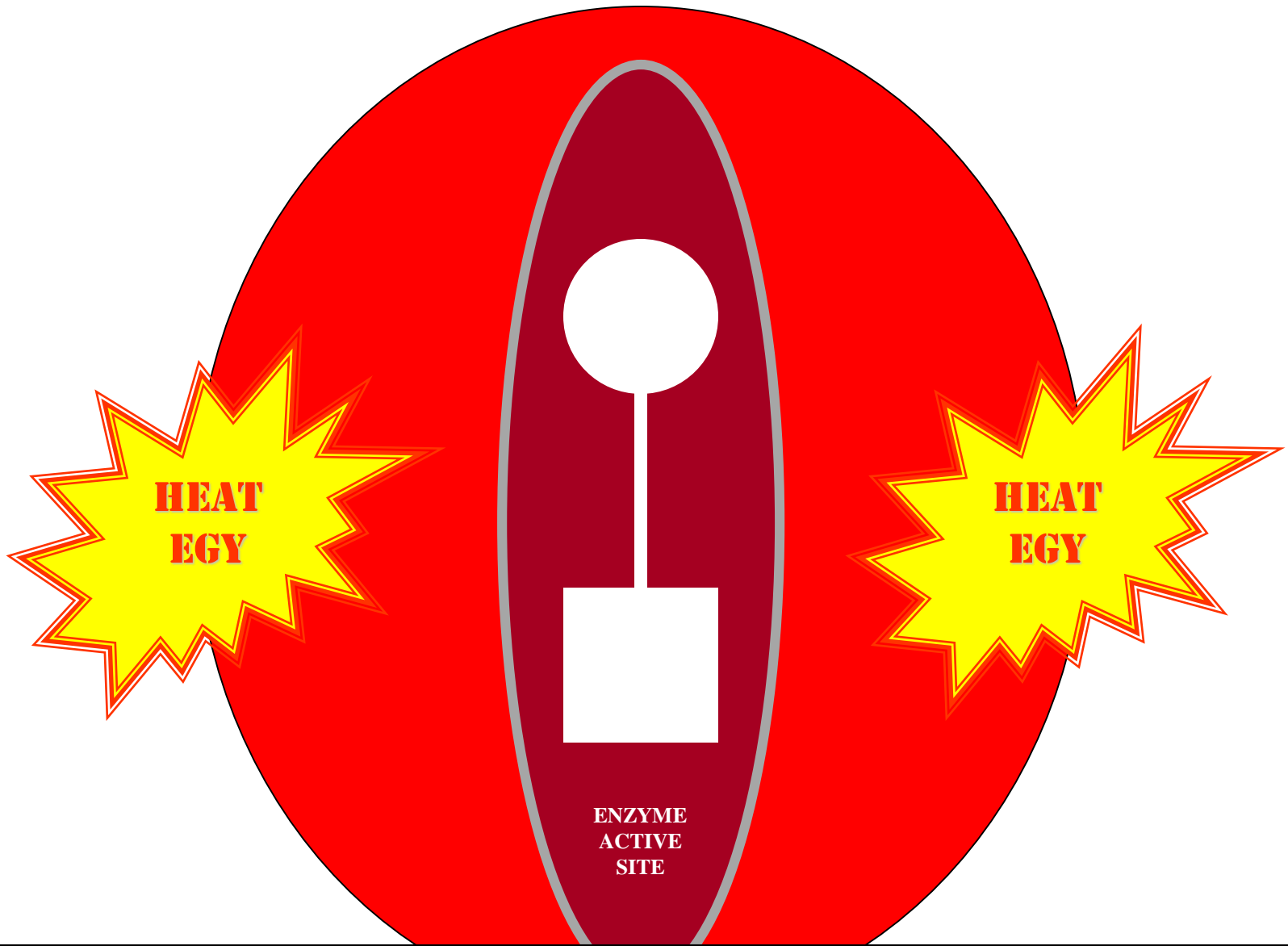
INCREASE MOLECULAR MOVEMENT



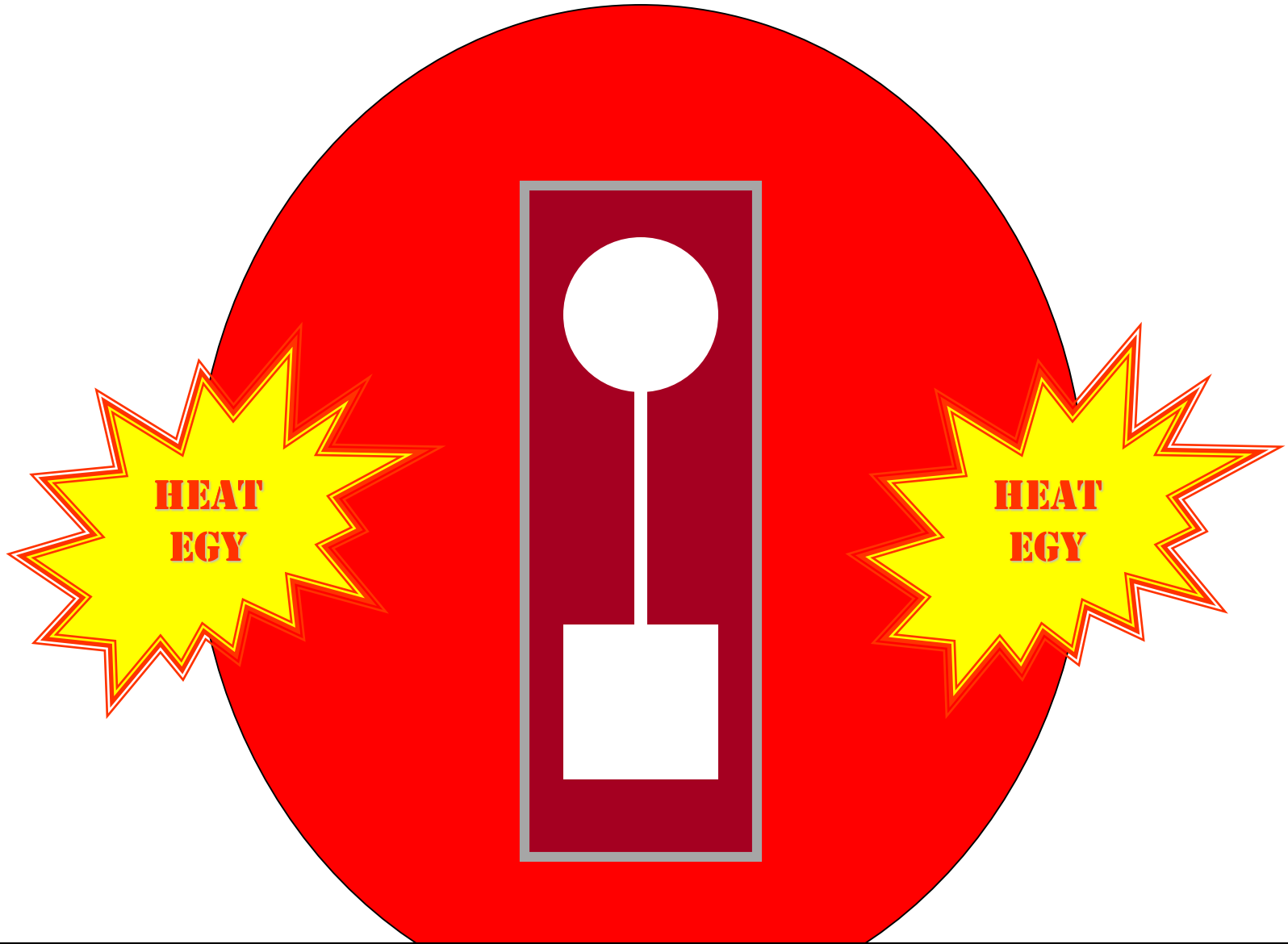
WEAK ENZYME H-BONDS



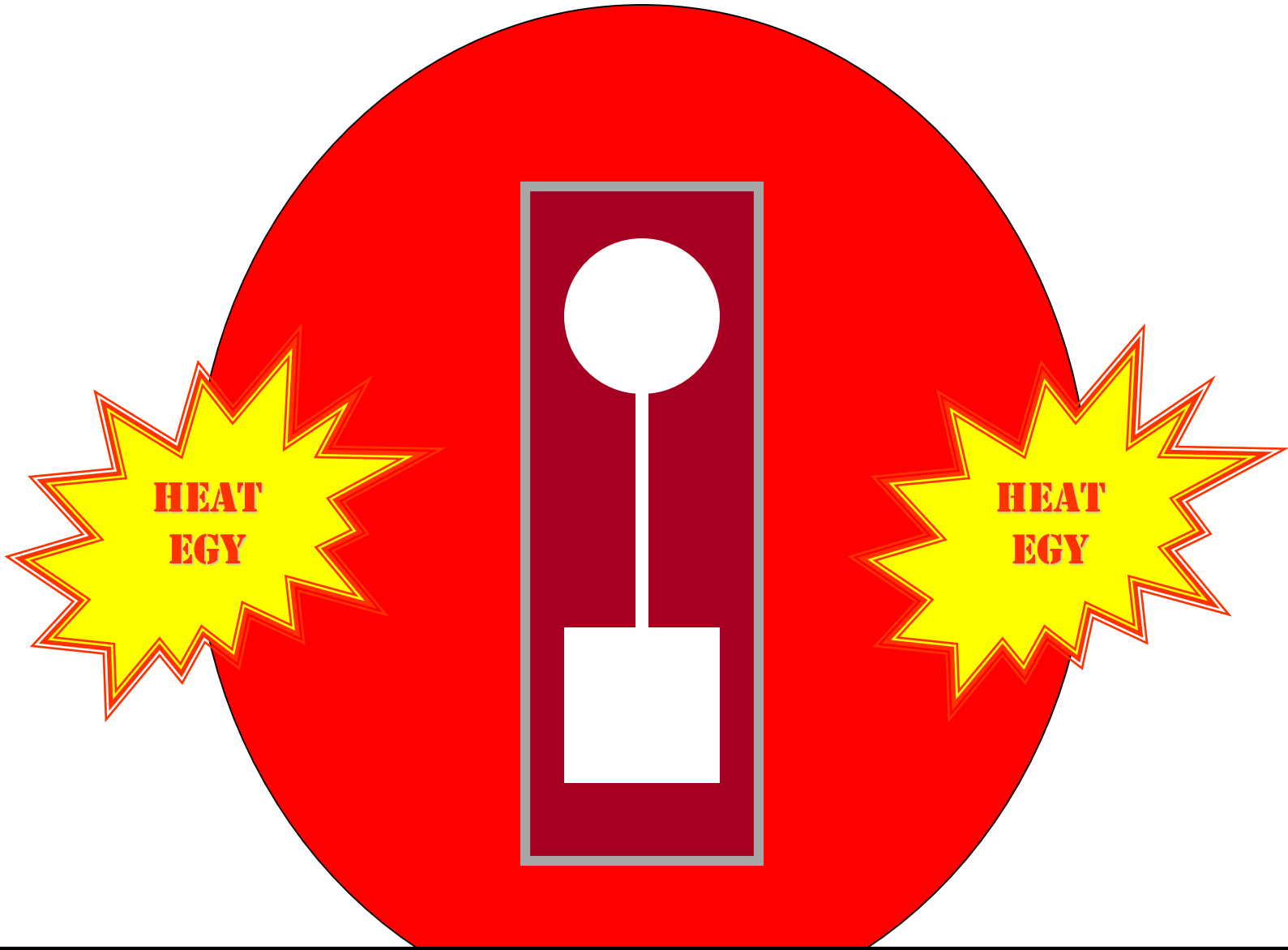
H-BONDS BREAK-DOWN



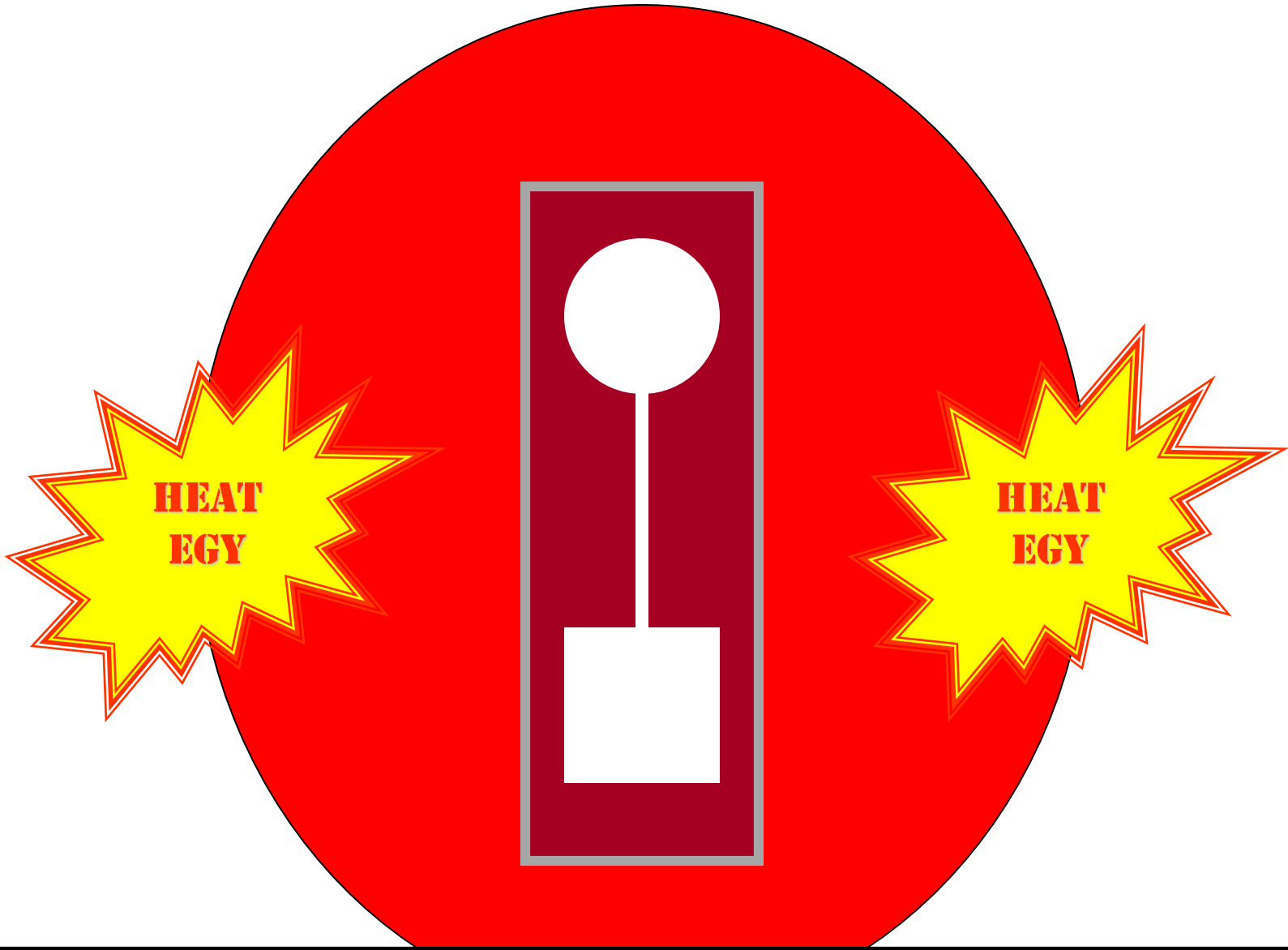
ENZYME



ENZYME CHANGES CONFORMATION



ENZYME DENATURES



ACTIVE SITE