

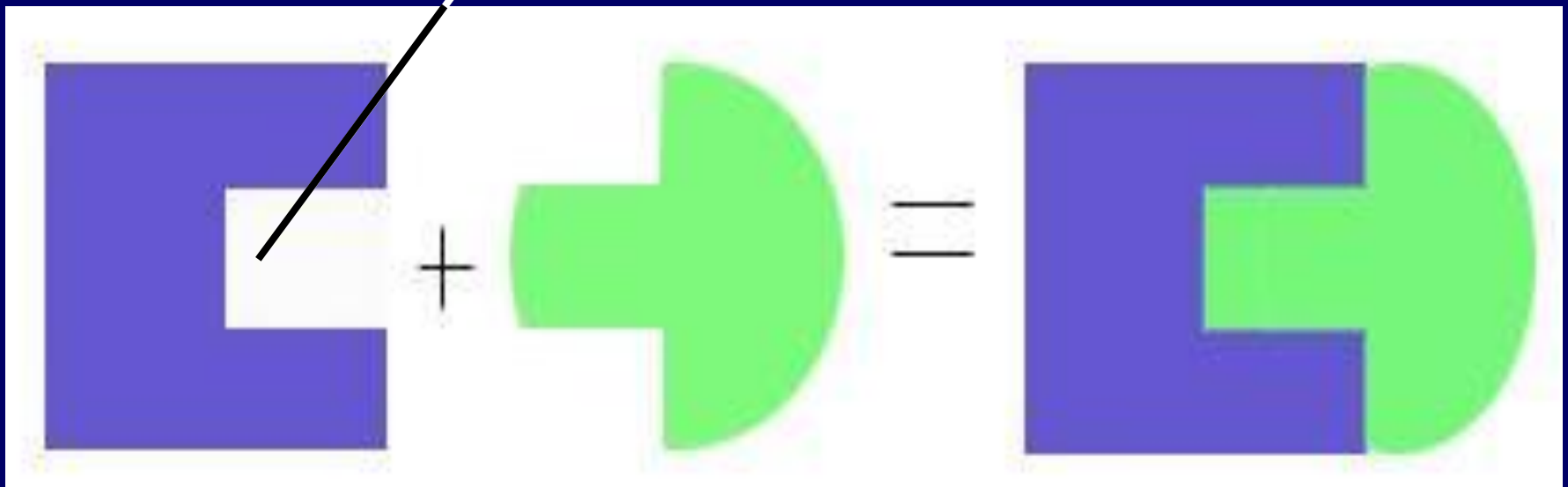
**LES ENZYMES.**  
**LES ASPECTS MEDICAUX**  
**DE L'ENZYMOLOGIE**

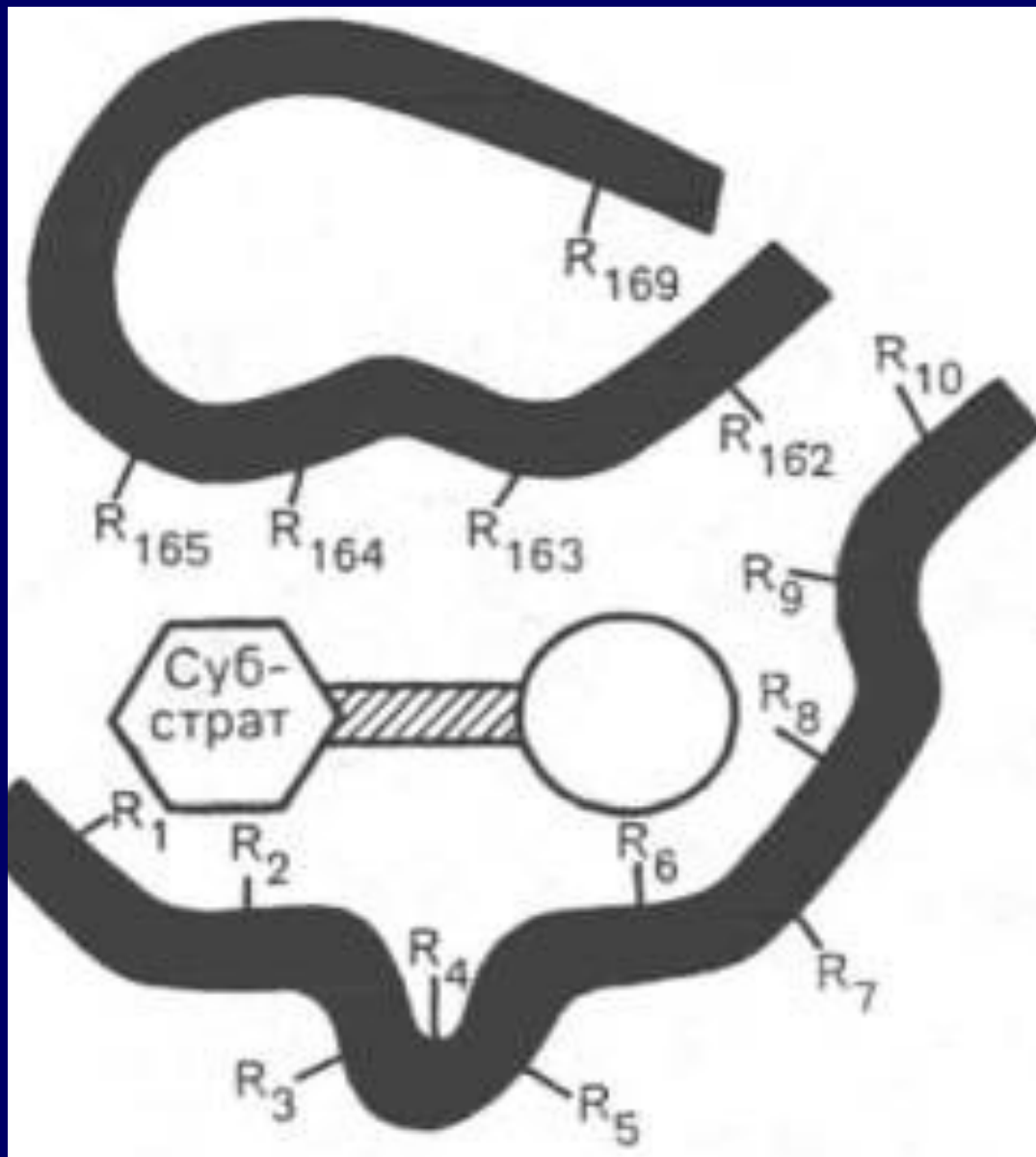
# LA COENZYME LIANT LE DOMAINE

L'ENZYME  
INACTIVE

LA  
VITAMINE

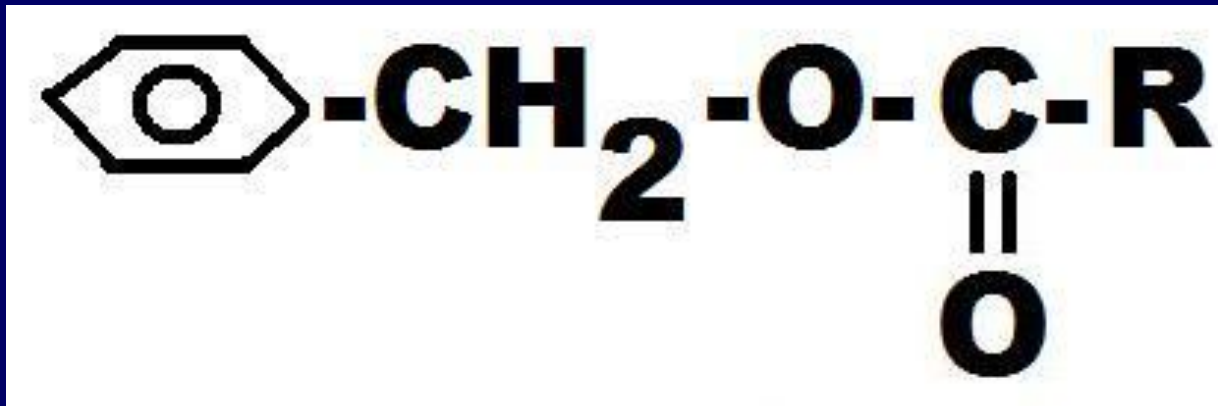
L'ENZYME  
ACTIVE





# LE CENTRE ACTIF DES ENZYMES

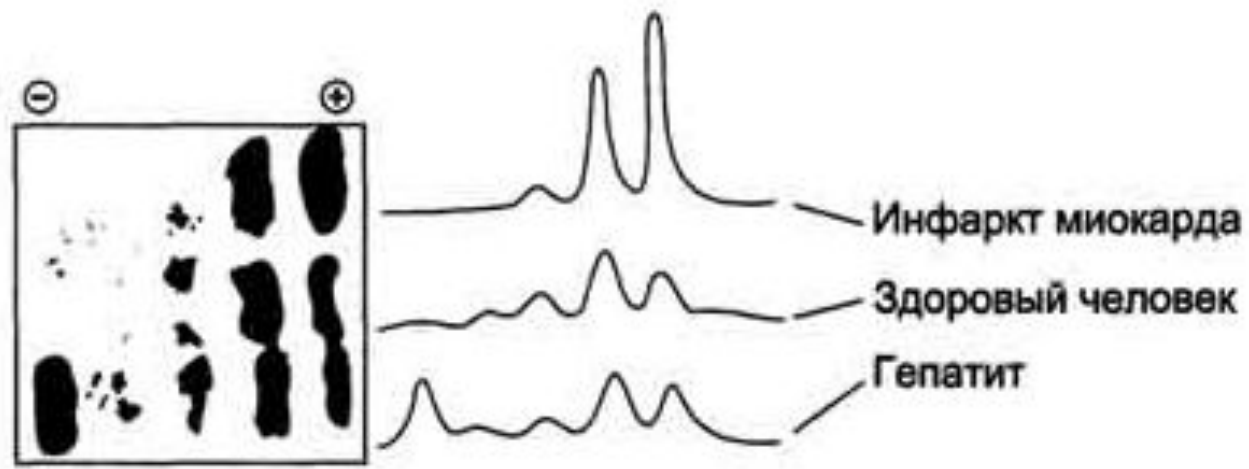
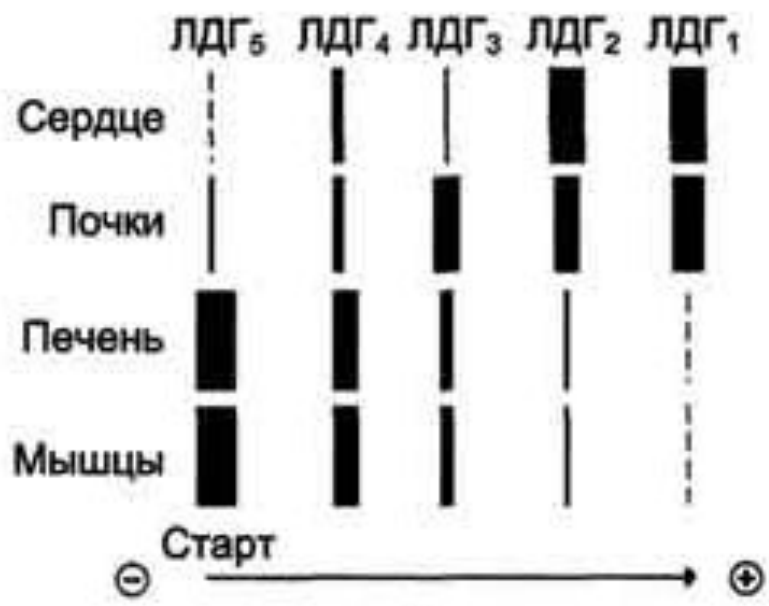
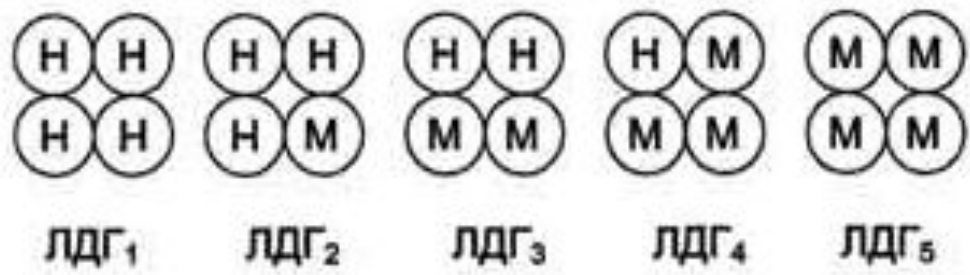
# LA MOLECULE DE CHIMOTRYPSINOGENE



LE CENTRE LIANT

LE CENTRE  
CATALYTIQUE

LE CENTRE ACTIF



# **LA CLASSIFICATION DES ENZYMES**

- 1. LES OXYDOREDUCTASES**
- 2. LES TRANSFERASES**
- 3. LES HYDROLASES**
- 4. LES LYASES (SYNTHASES)**
- 5. LES ISOMERASES**
- 6. LES LIGASES  
(SYNTHETASES)**

# 1. LES OXYDOREDUCTASES

```
graph TD; A[1. LES OXYDOREDUCTASES] --> B[LES DESHYDROGENASES AEROBIES (LES OXYDASES)]; A --> C[LES DESHYDROGENASES ANAEROBIES];
```

**LES  
DESHYDROGENASES  
AEROBIES  
(LES OXYDASES)**

**LES  
DESHYDROGENASES  
ANAEROBIES**

# LES COENZYMES DES OXYDOREDUCTASES

LA FORME  
OXYDEE

LA FORME  
REDUITE

**NAD<sup>+</sup>**

**NADH + H<sup>+</sup>**

**FAD**

**FADH<sub>2</sub>**

**NADP<sup>+</sup>**

**NADPH + H<sup>+</sup>**

**FMN**

**FMNH<sub>2</sub>**





**le L-malate**

**la malate  
déshydrogénase**



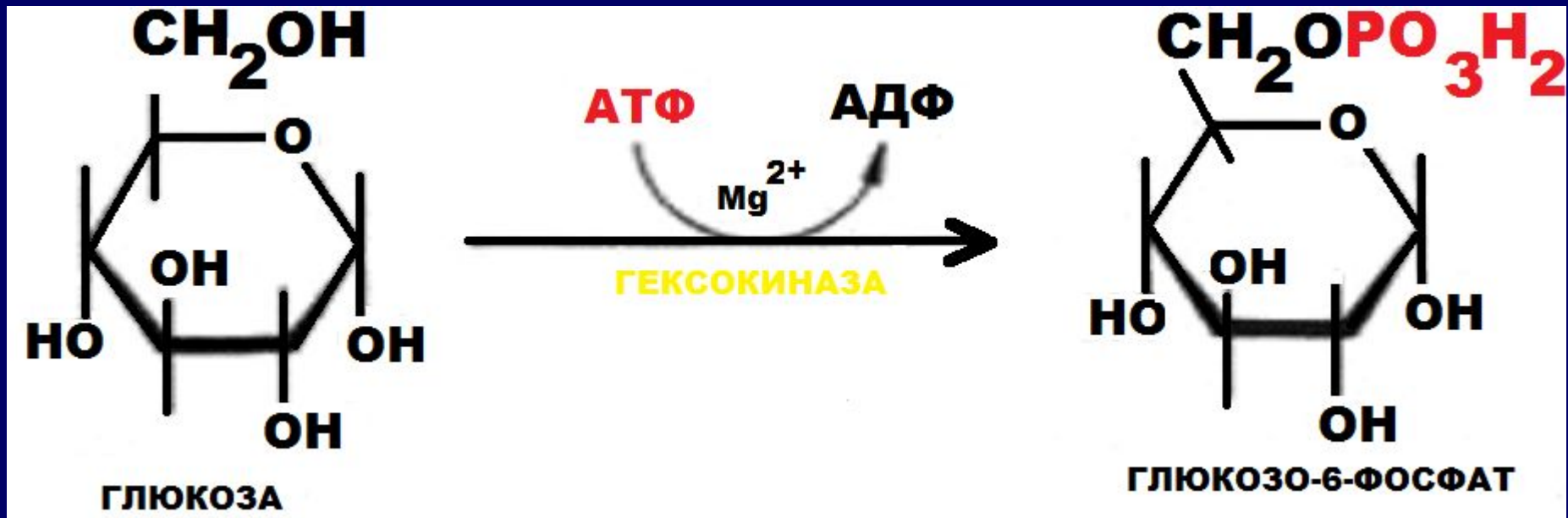
**l'oxaloacétate**



## **2. LES TRANSFERASES**

- PHOSPHOTRANSFERASES**
- AMINOTRANSFERASES**
- PROTEINES KINASES**
- GLYCOSYLTRANSFERASES**
- ACYLTRANSFERASES**

# LA PHOSPHOTRANSFERASE:



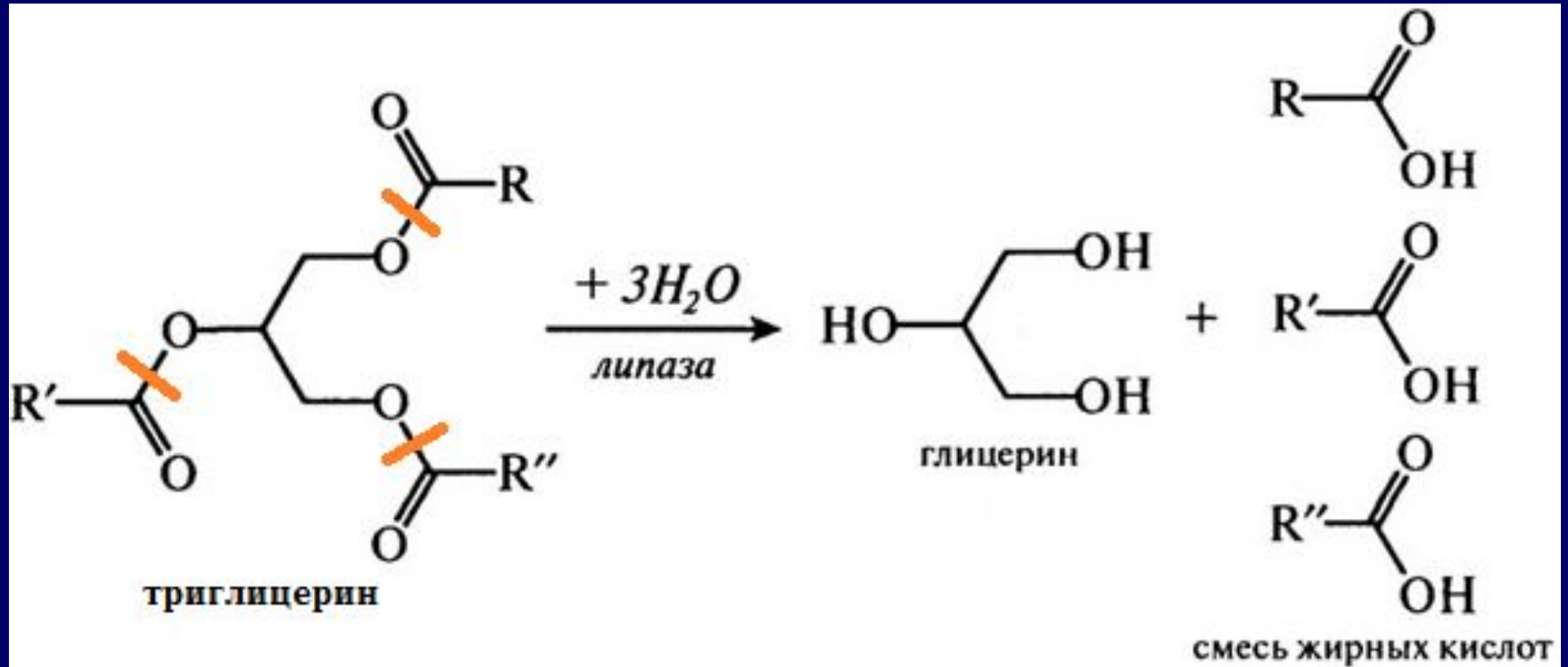
# L'AMINOTRANSFERASE:



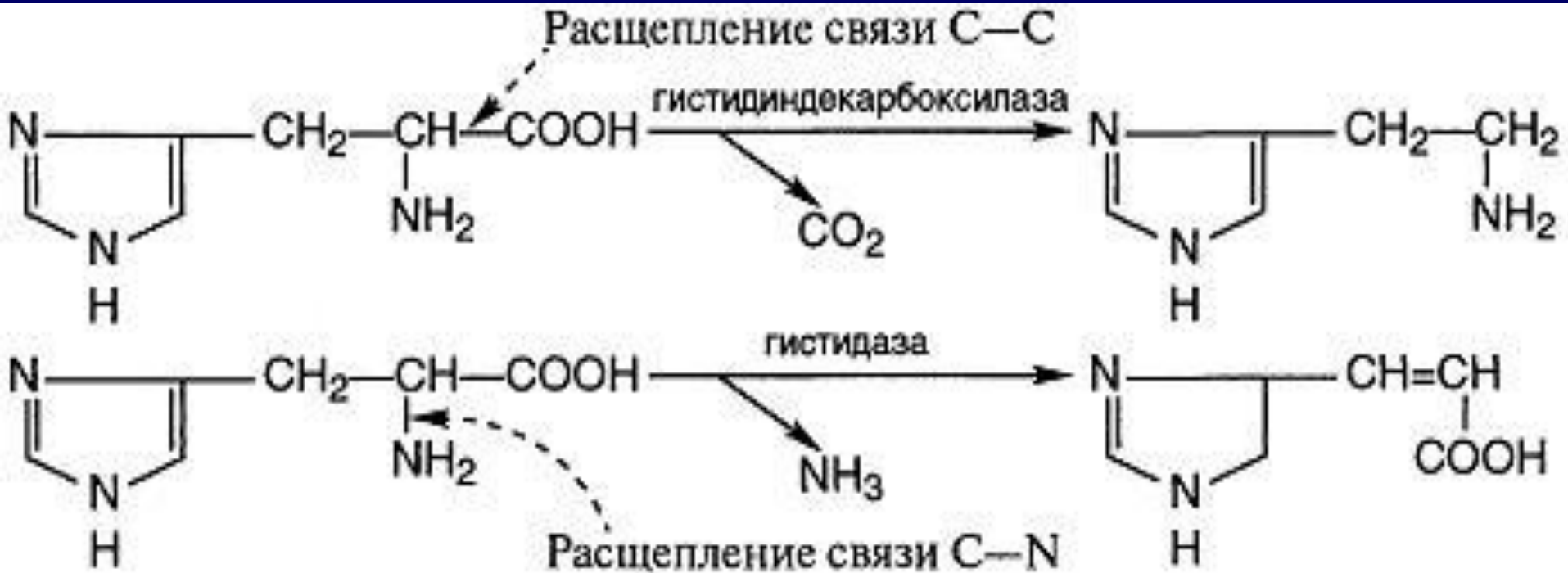
# **3. LES HYDROLASES**

- ESTERASES**
- PHOSPHATASES**
- GLYCOSIDASES**
- PEPTIDES HYDROLASES**

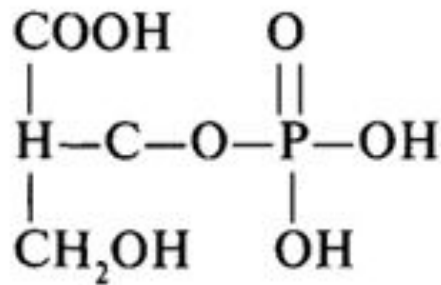
# L'ESTERASE:



# 4. LES LYASES (SYNTHASES)

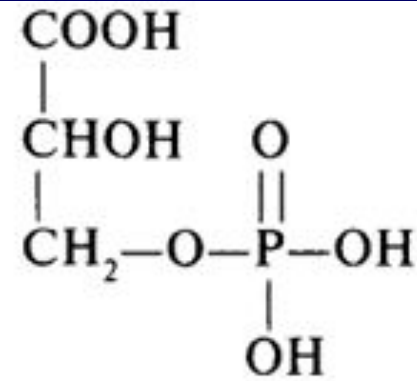


# 5. LES ISOMERASES

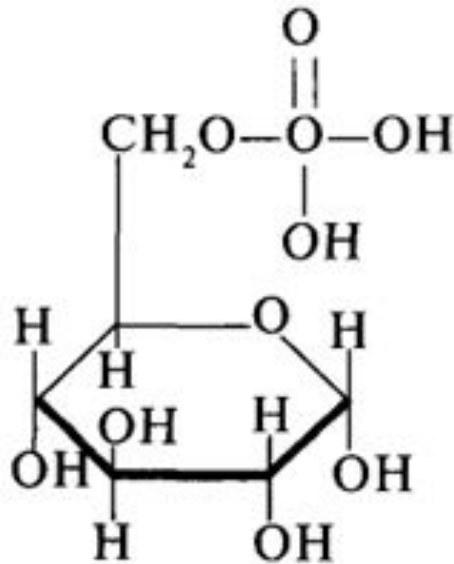


2-Фосфоглицериновая  
кислота

Фосфоглицерат-  
фосфомутаза

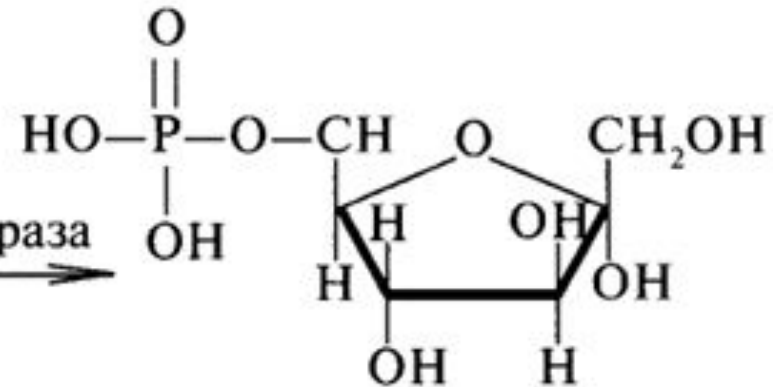


3-Фосфоглицериновая  
кислота



Глюкозо-6-фосфат

Глюкозофосфатизомераза



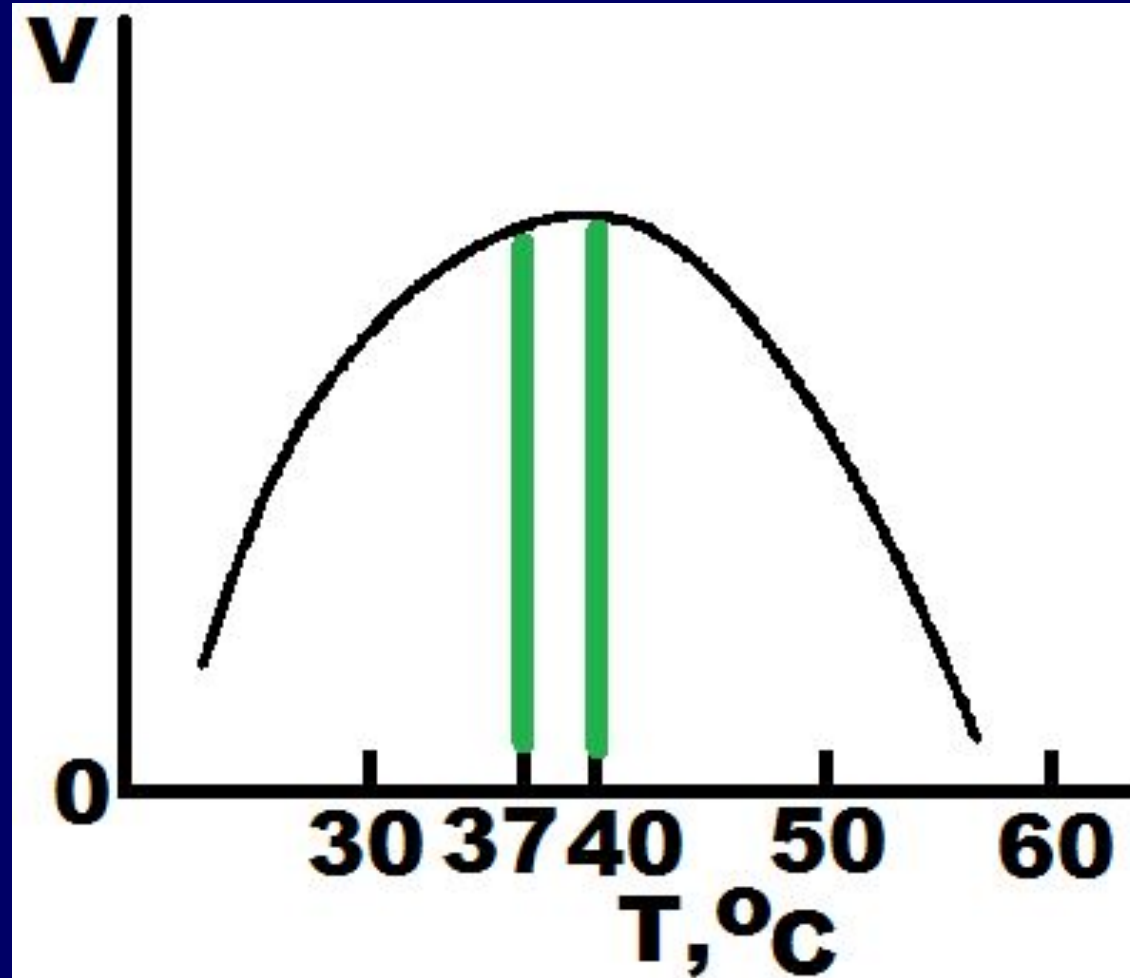
Фруктозо-6-фосфат



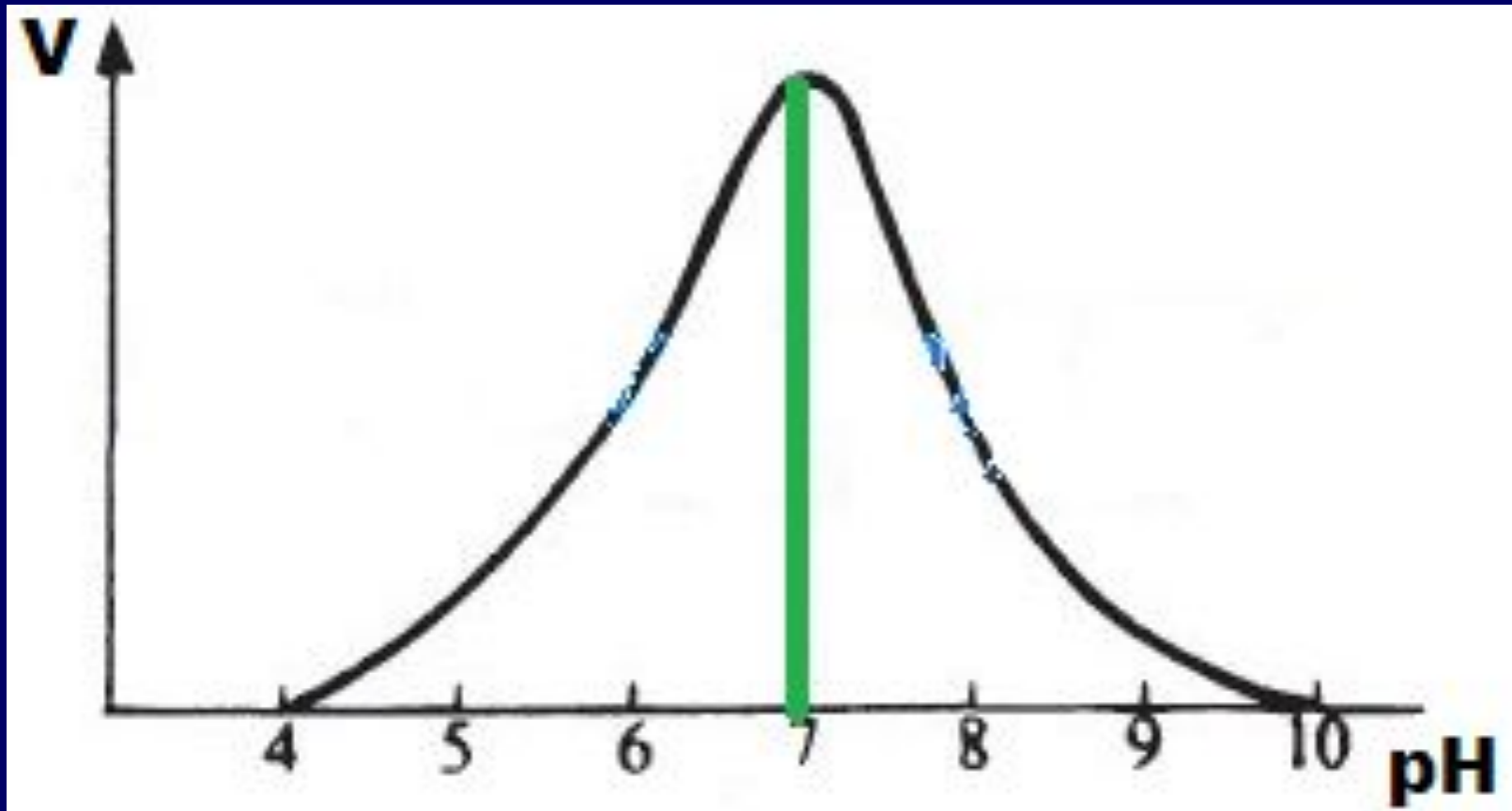
# 6. LES LIGASES (SYNTHETASES)



# LA DEPENDANCE DE LA VITESSE DE LA REACTION ENZYMATIQUE (V) DE LA TEMPERATURE (T)

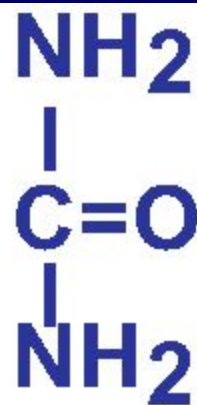


# LA DEPENDANCE DE LA VITESSE DE LA REACTION ENZYMATIQUE (V) DU pH DU MILIEU



# L'UREASE



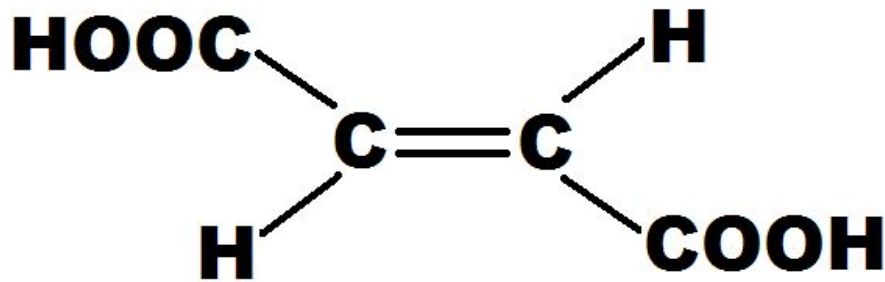
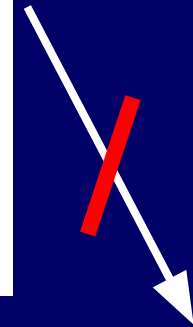
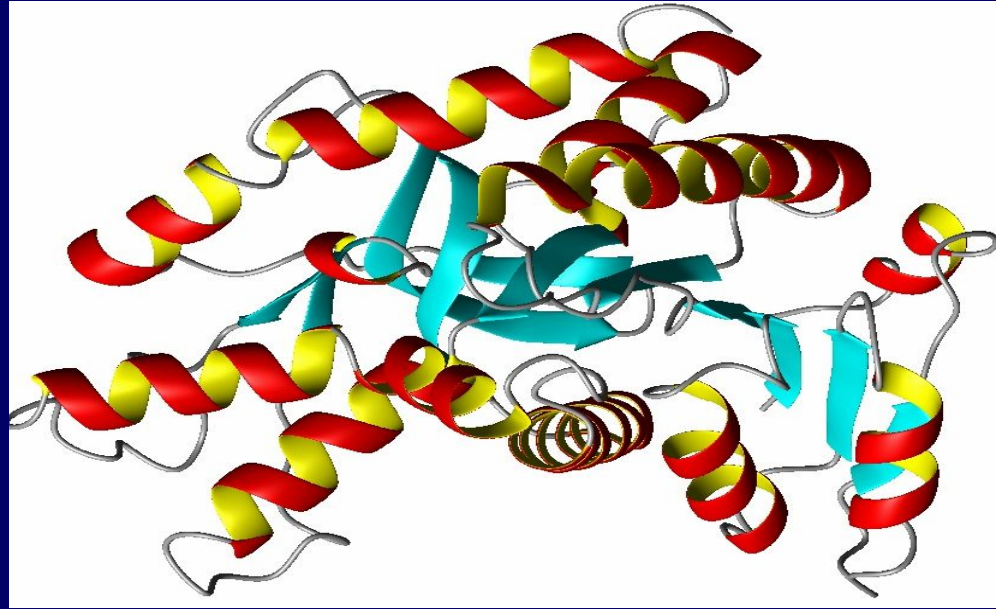


МОЧЕВИНА

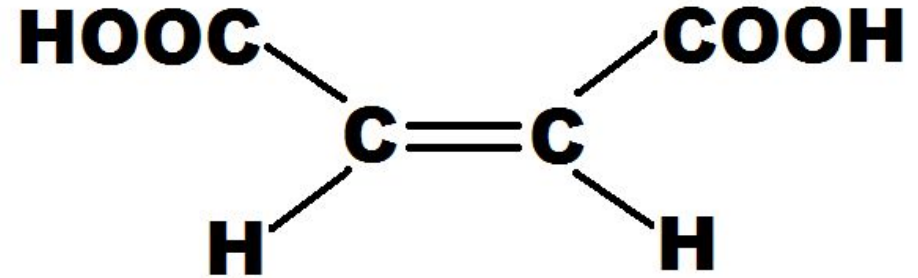


ТИОМОЧЕВИНА

# LA FUMARASE



**L'ACIDE  
FUMARIQUE**

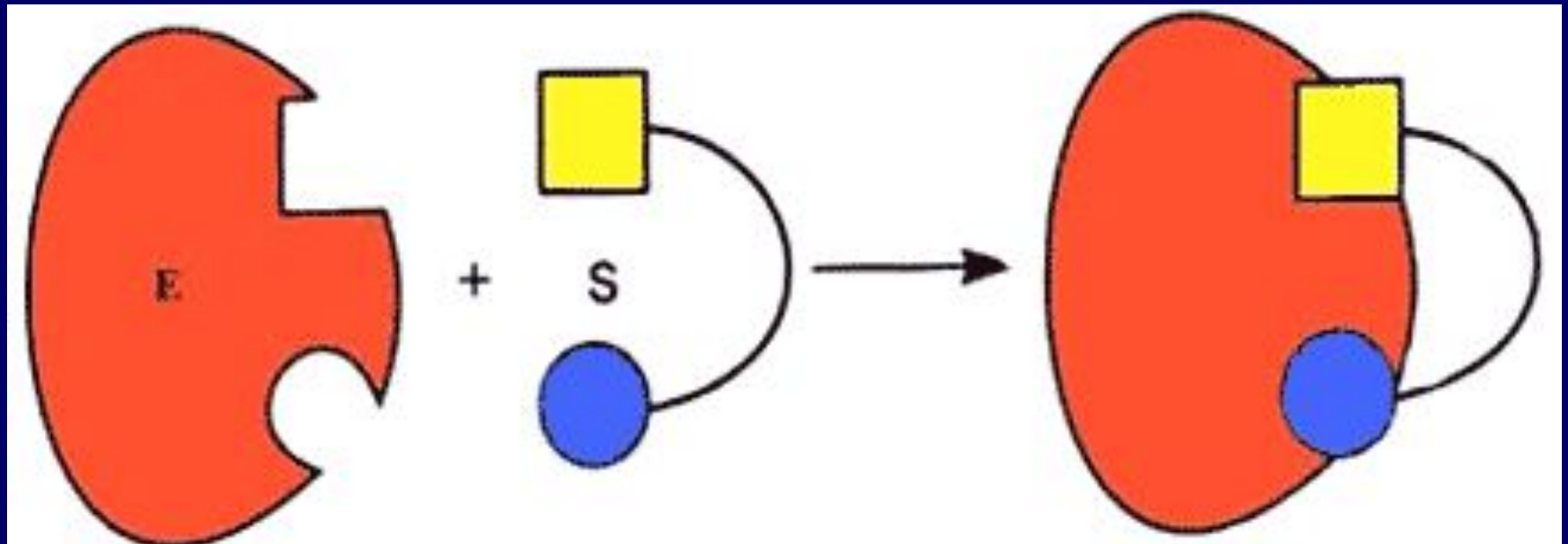


**L'ACIDE  
MALEIQUE**



**HERMANN  
EMIL  
FISCHER  
(1852 - 1919)**

# «CLEF – SERRURE»

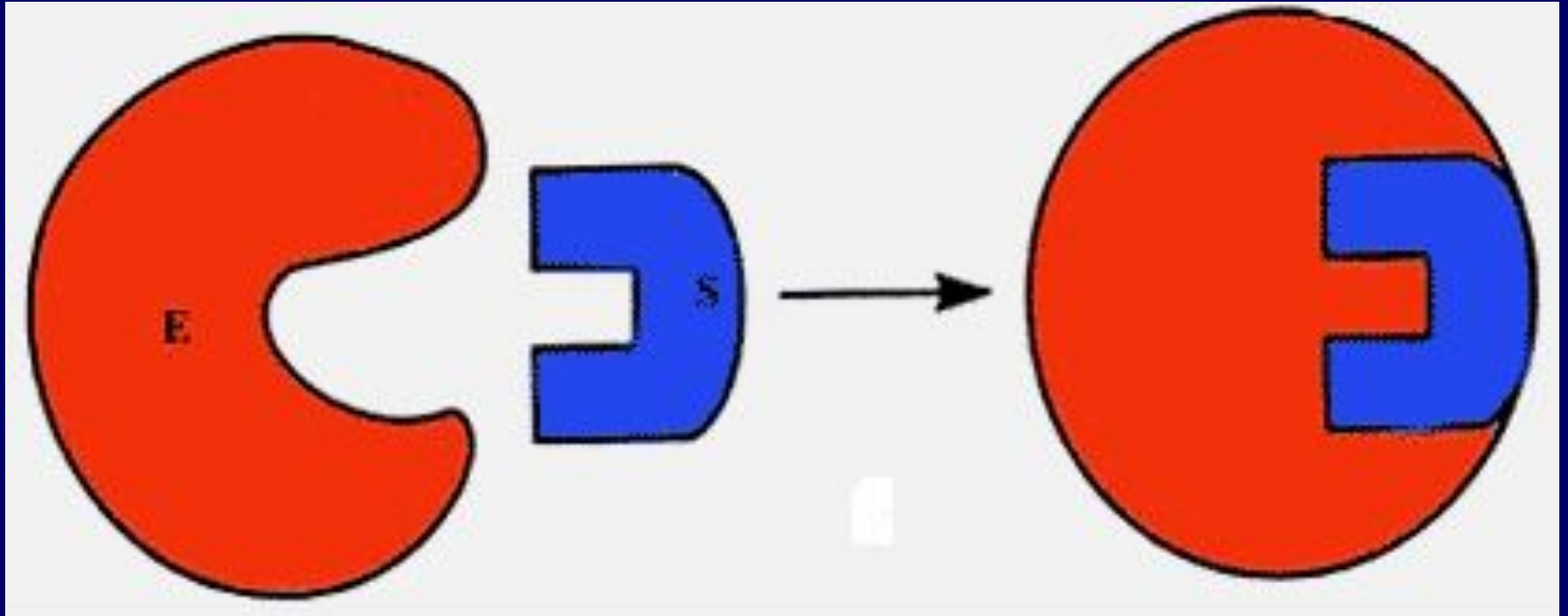






**DANIEL  
KOSHLAND  
(1920 - 2007)**

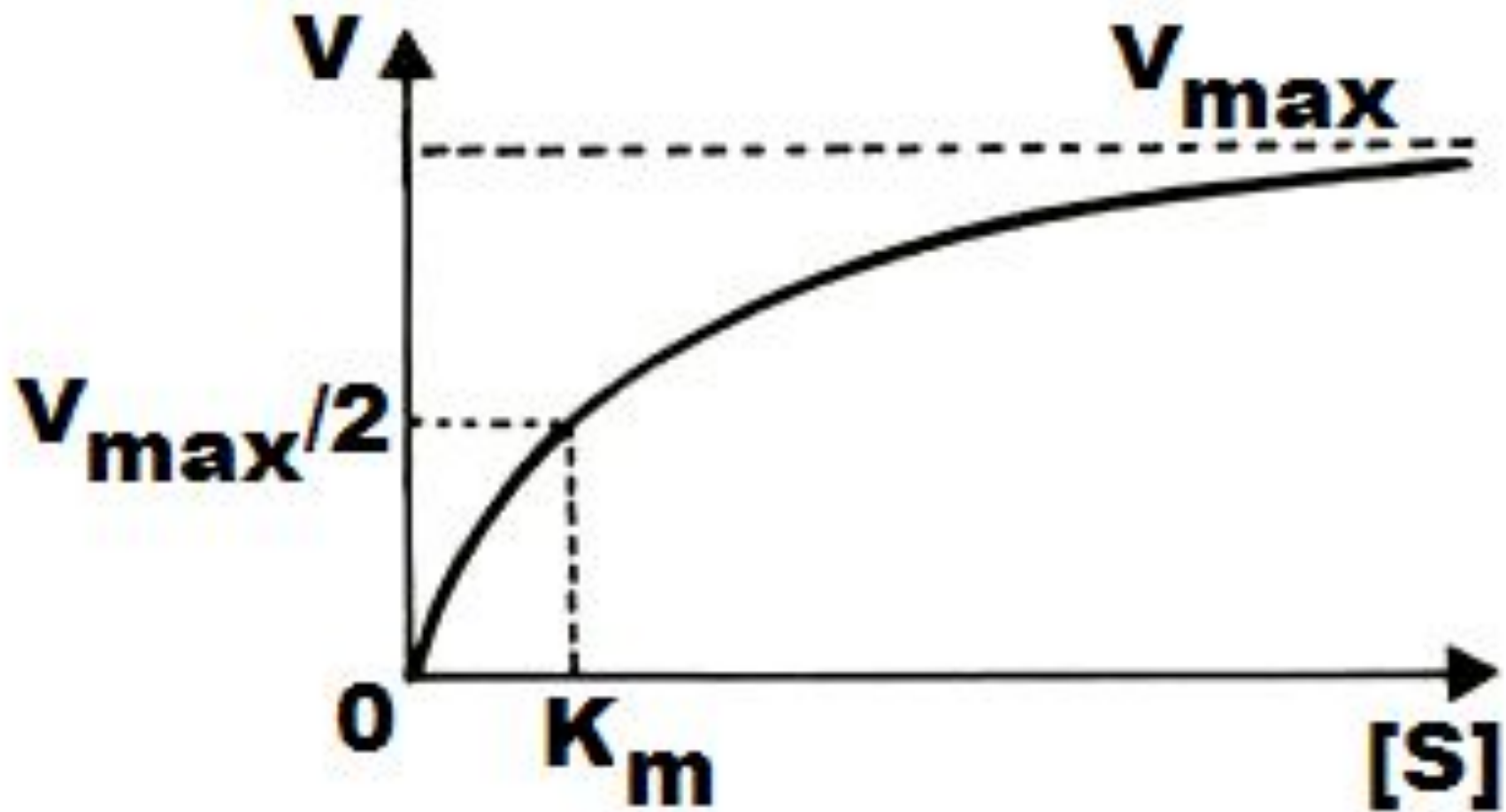
# «GANT – MAIN»





**L'équation  
de Briggs – Haldane:**

$$V = \frac{V_{\max}[S]}{K_M + [S]}$$





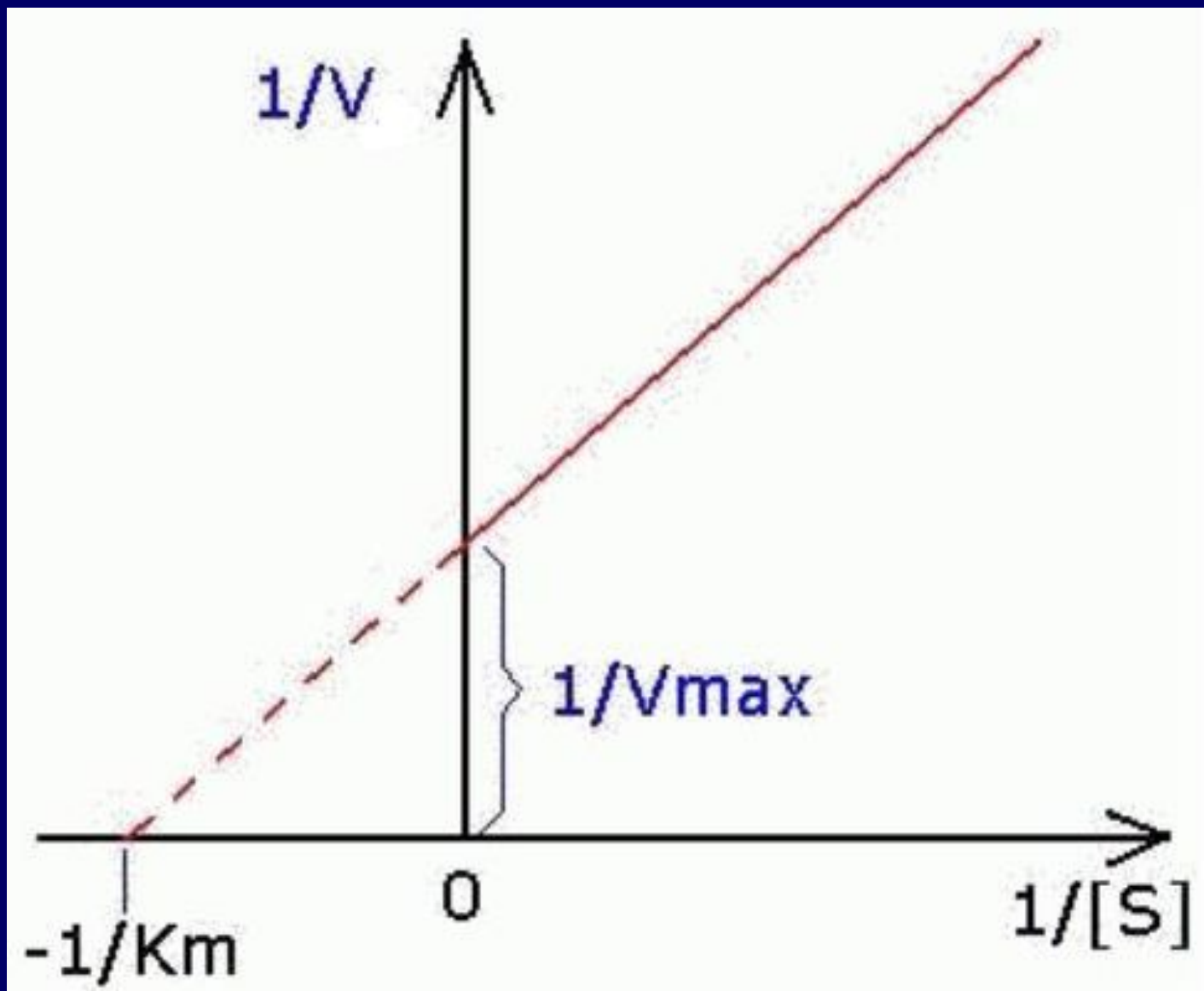
**LEONOR  
MICHAELIS  
(1875 - 1949)**



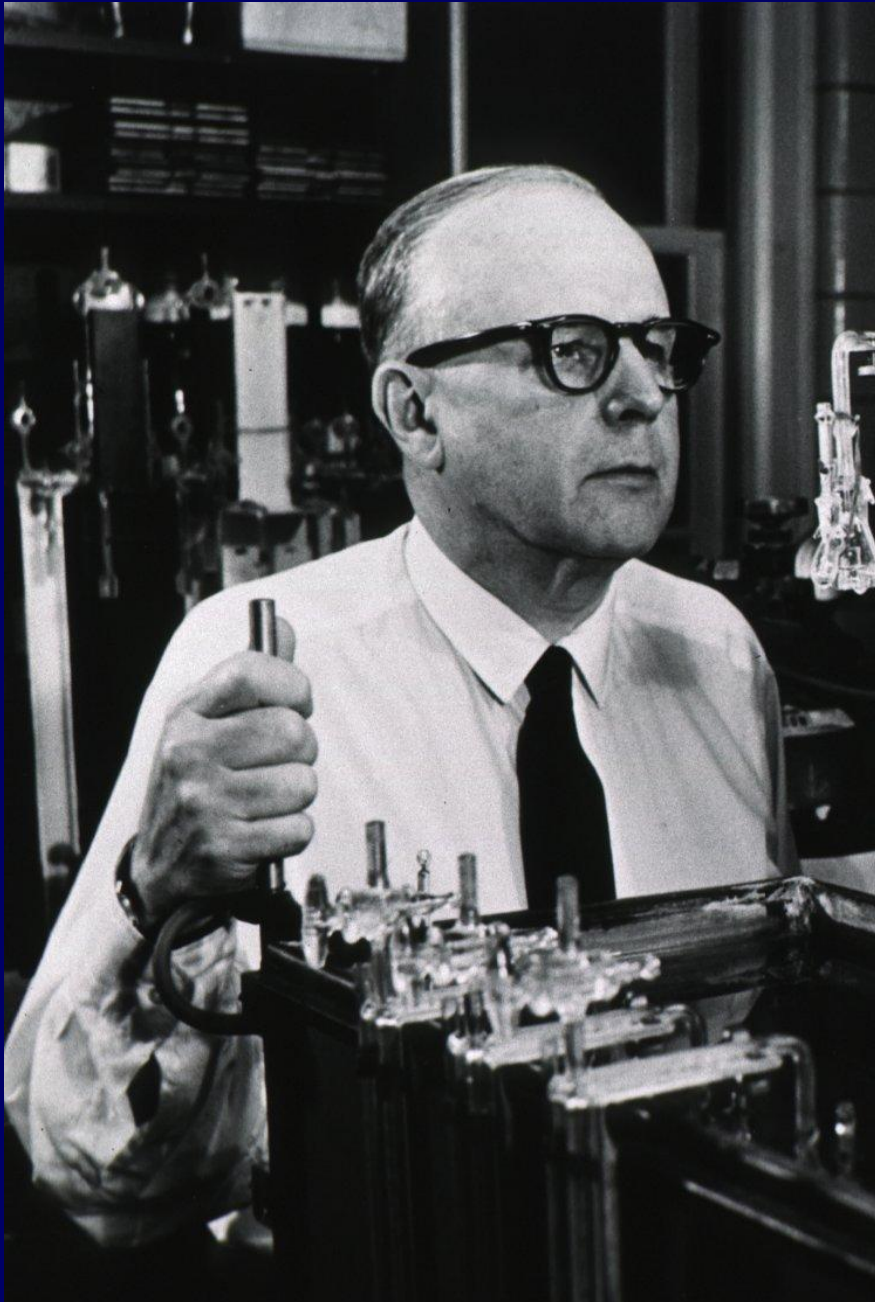
**MAUD  
LEONORA  
MENTEN  
(1879 - 1960)**

# L'équation de Lineweaver – Bark:

$$\frac{1}{V} = \frac{1}{V_{\max}} + \frac{K_m \cdot 1}{V_{\max} [S]}$$







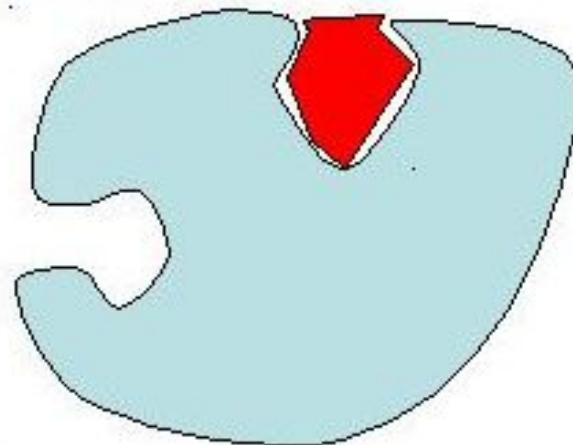
**DEAN  
BARK  
(1904 - 1988)**

# Обратимые ингибиторы

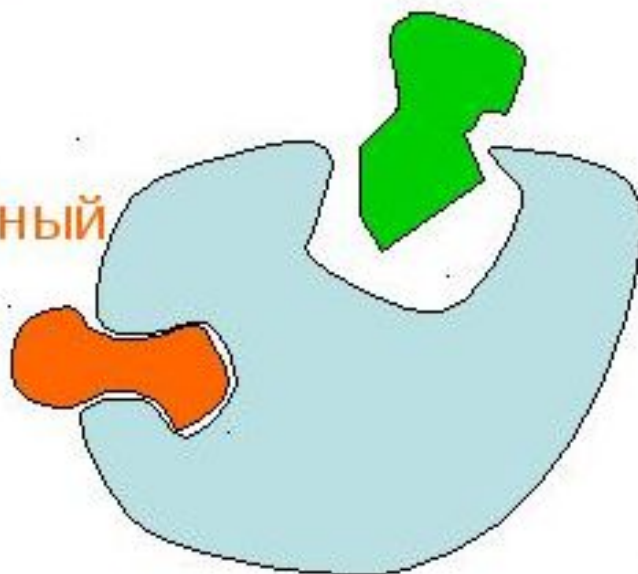
субстрат



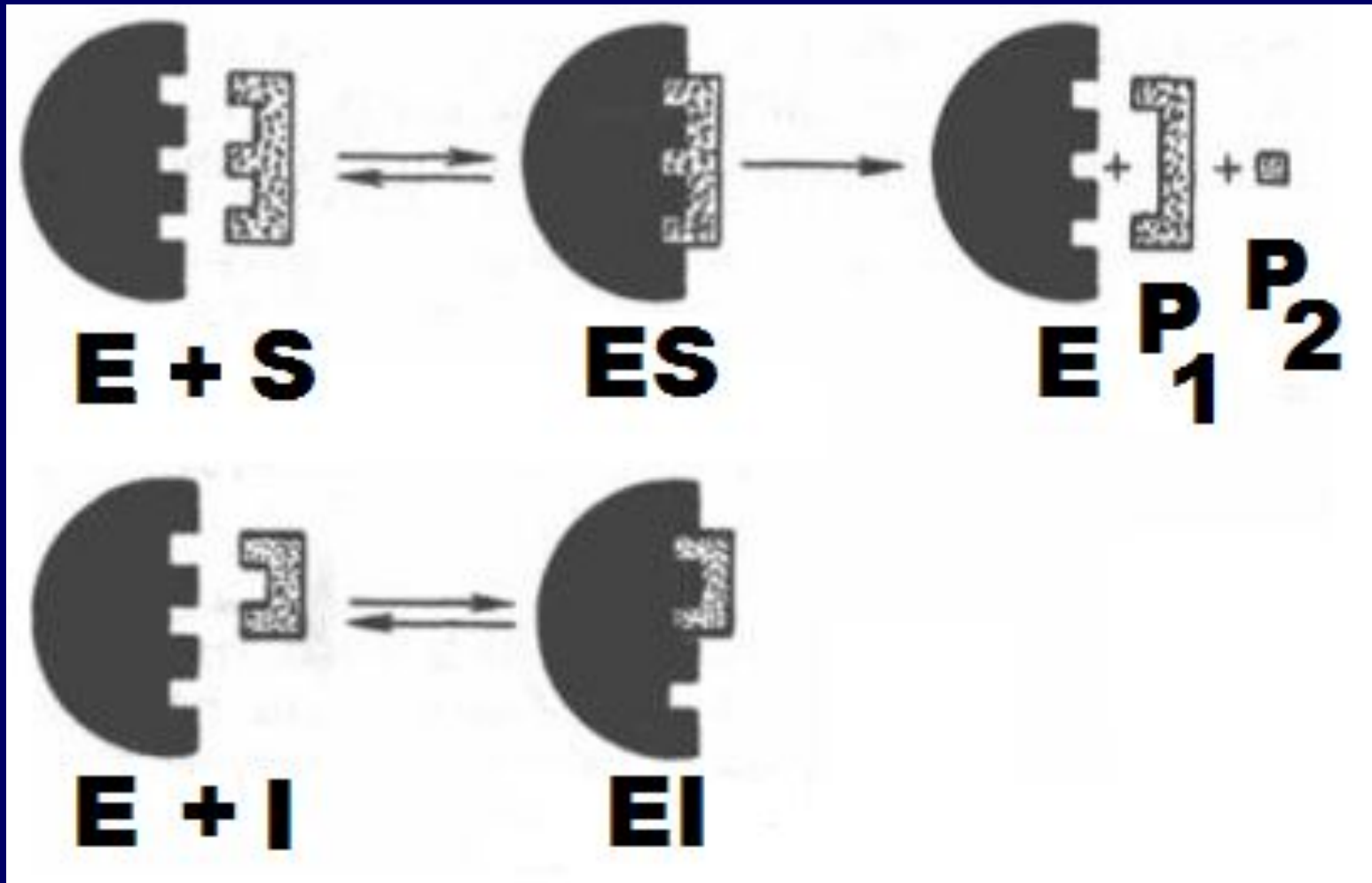
конкурентный  
ингибитор

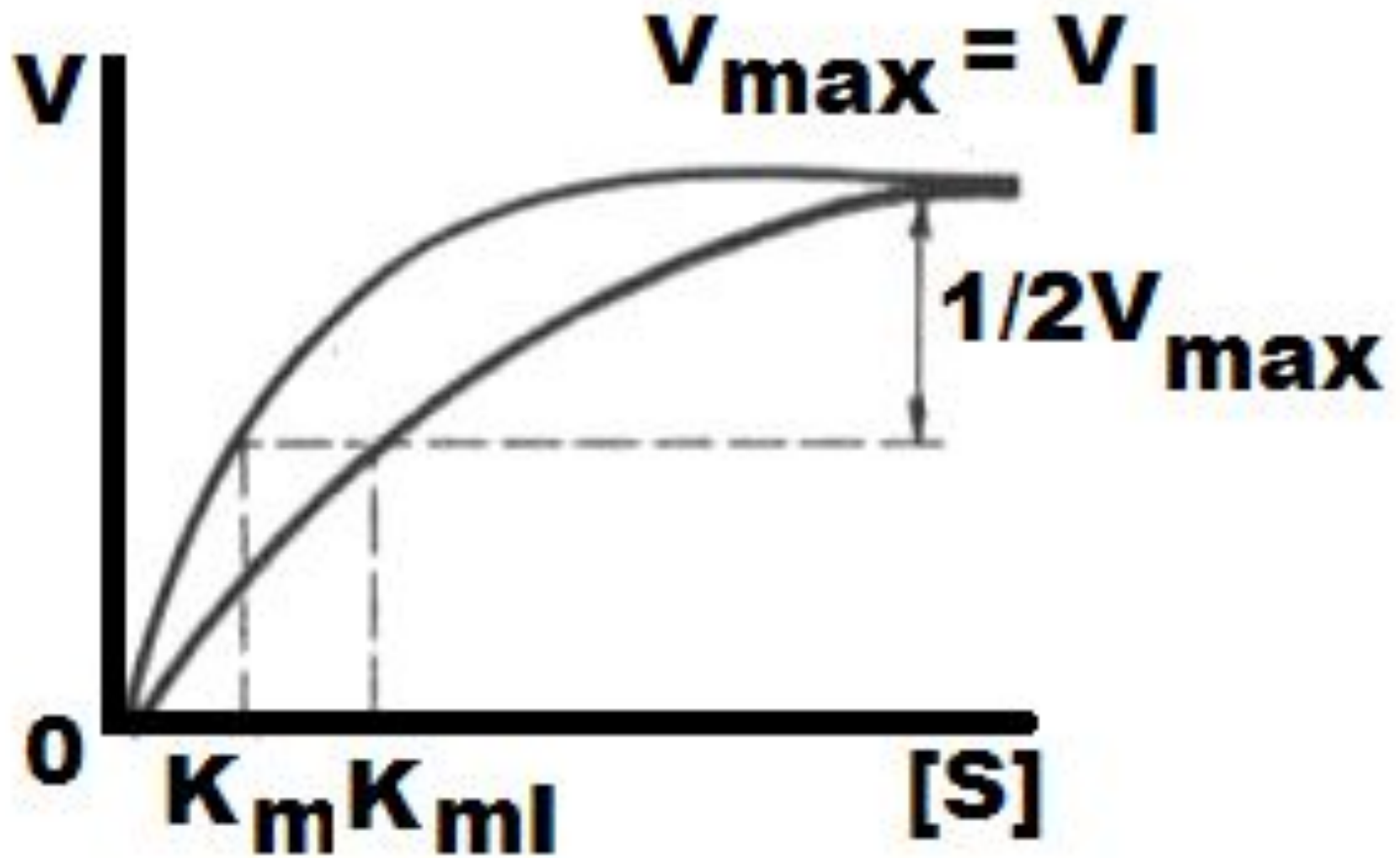


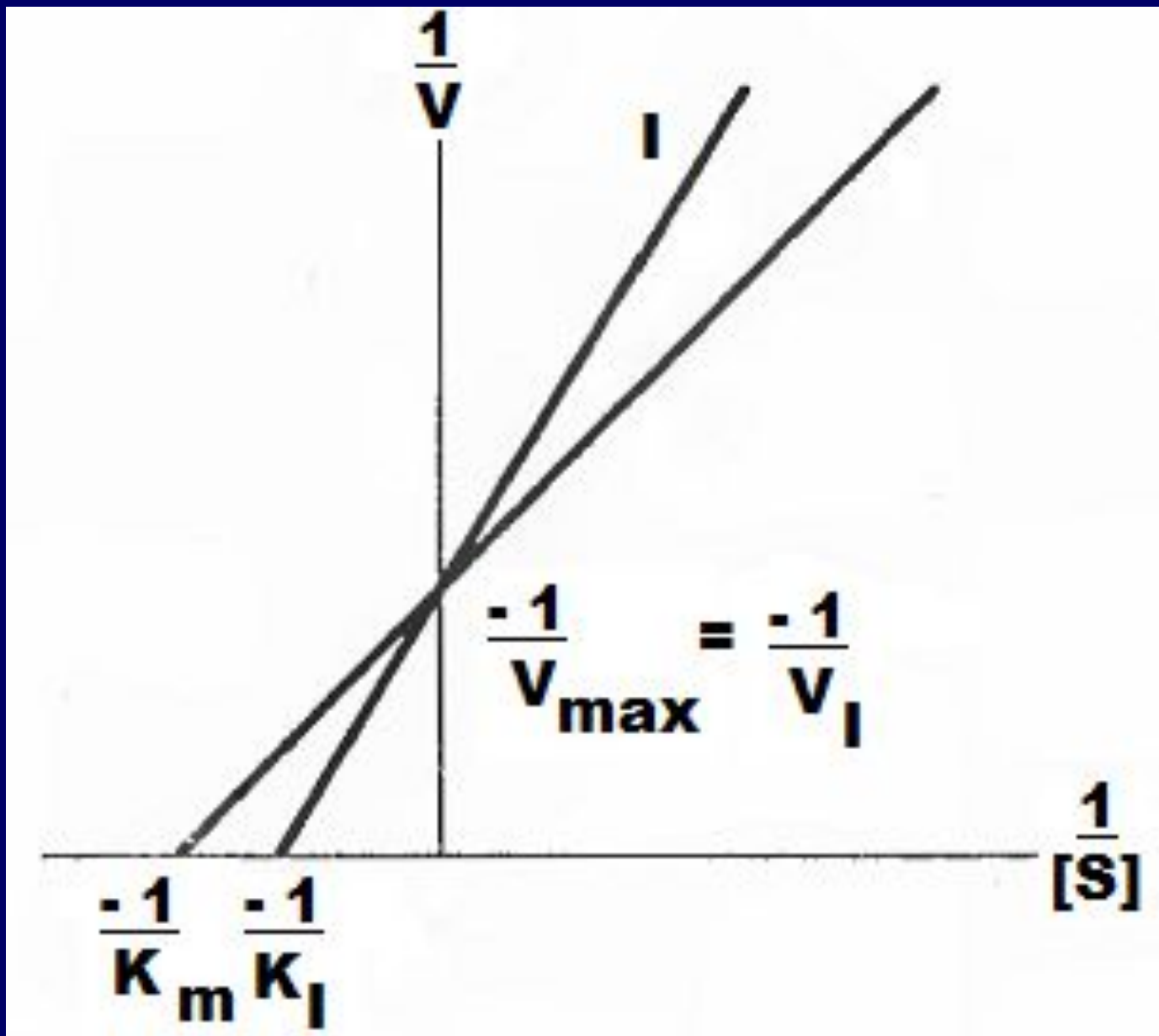
неконкурентный  
ингибитор



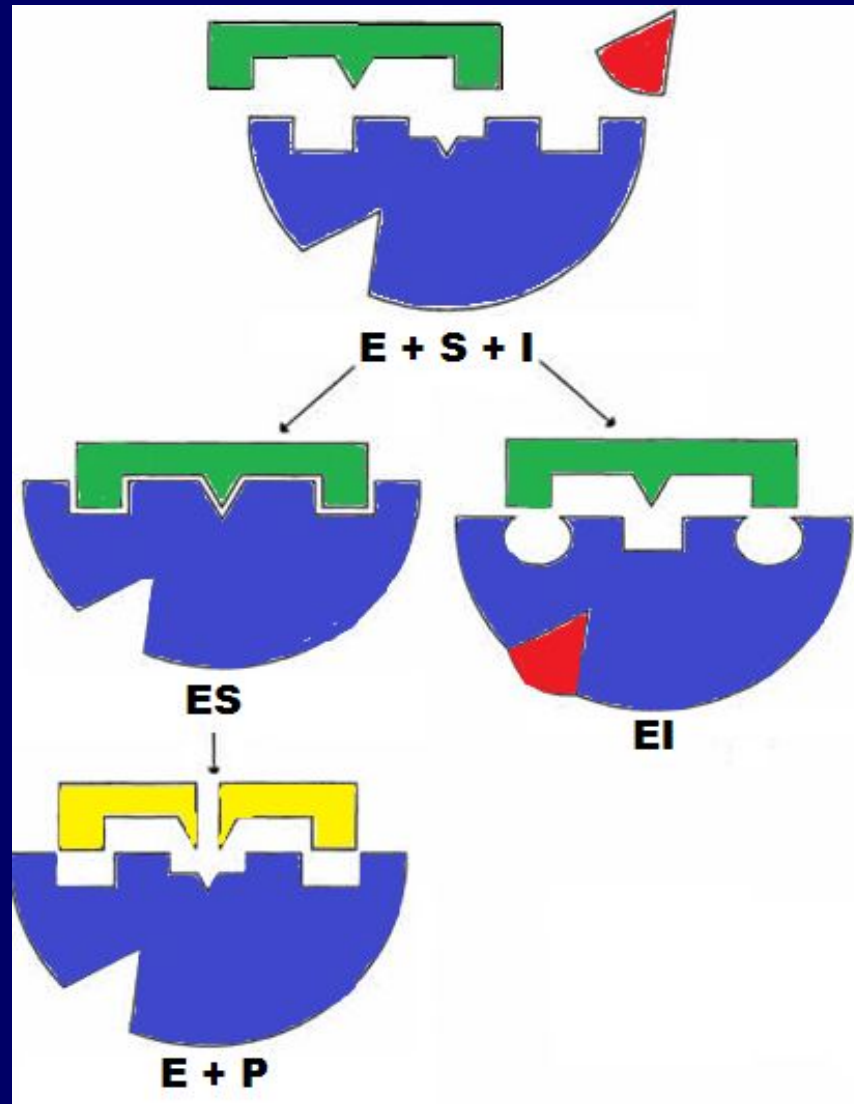
# L'INHIBITION COMPETITIVE

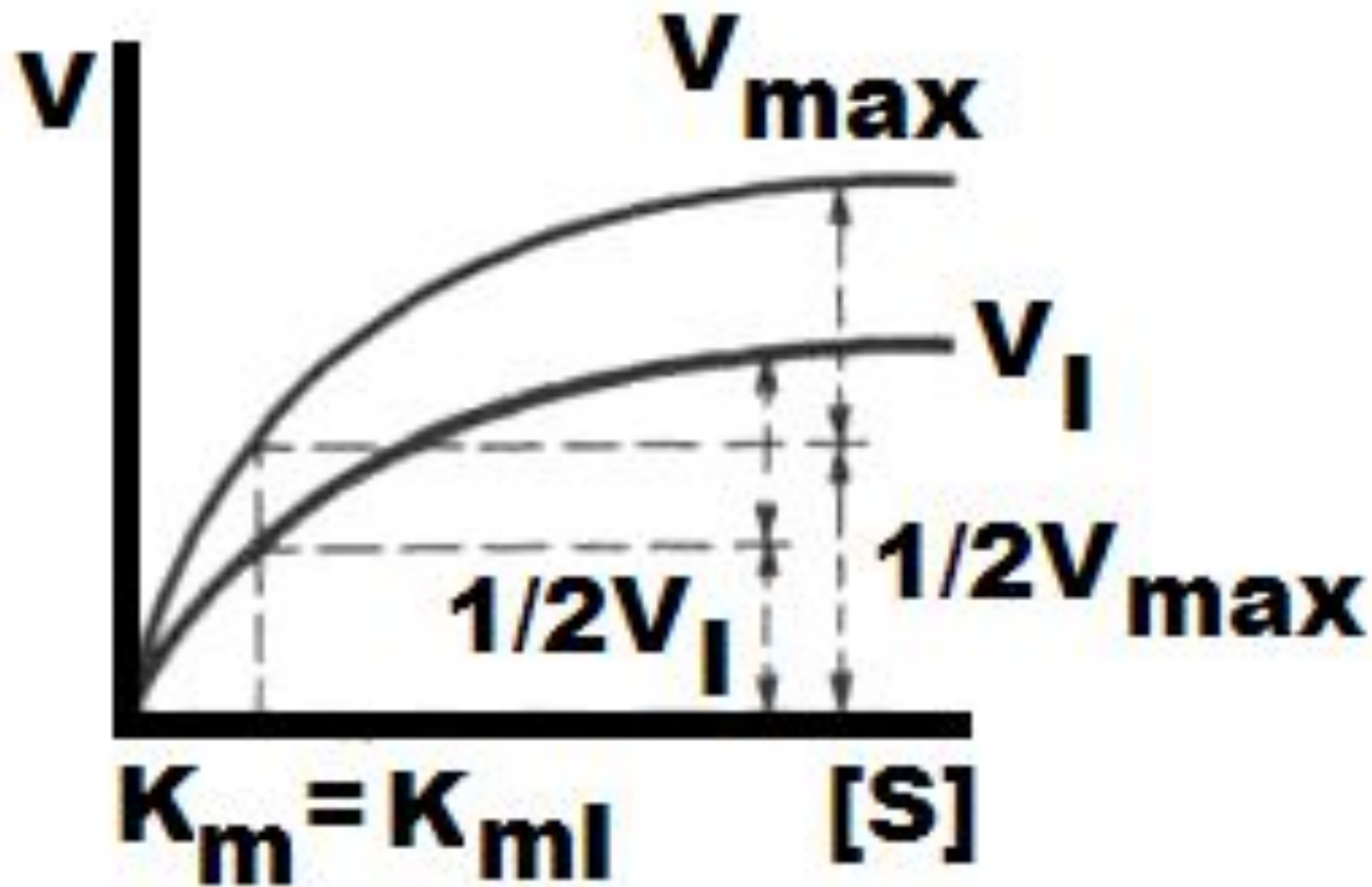


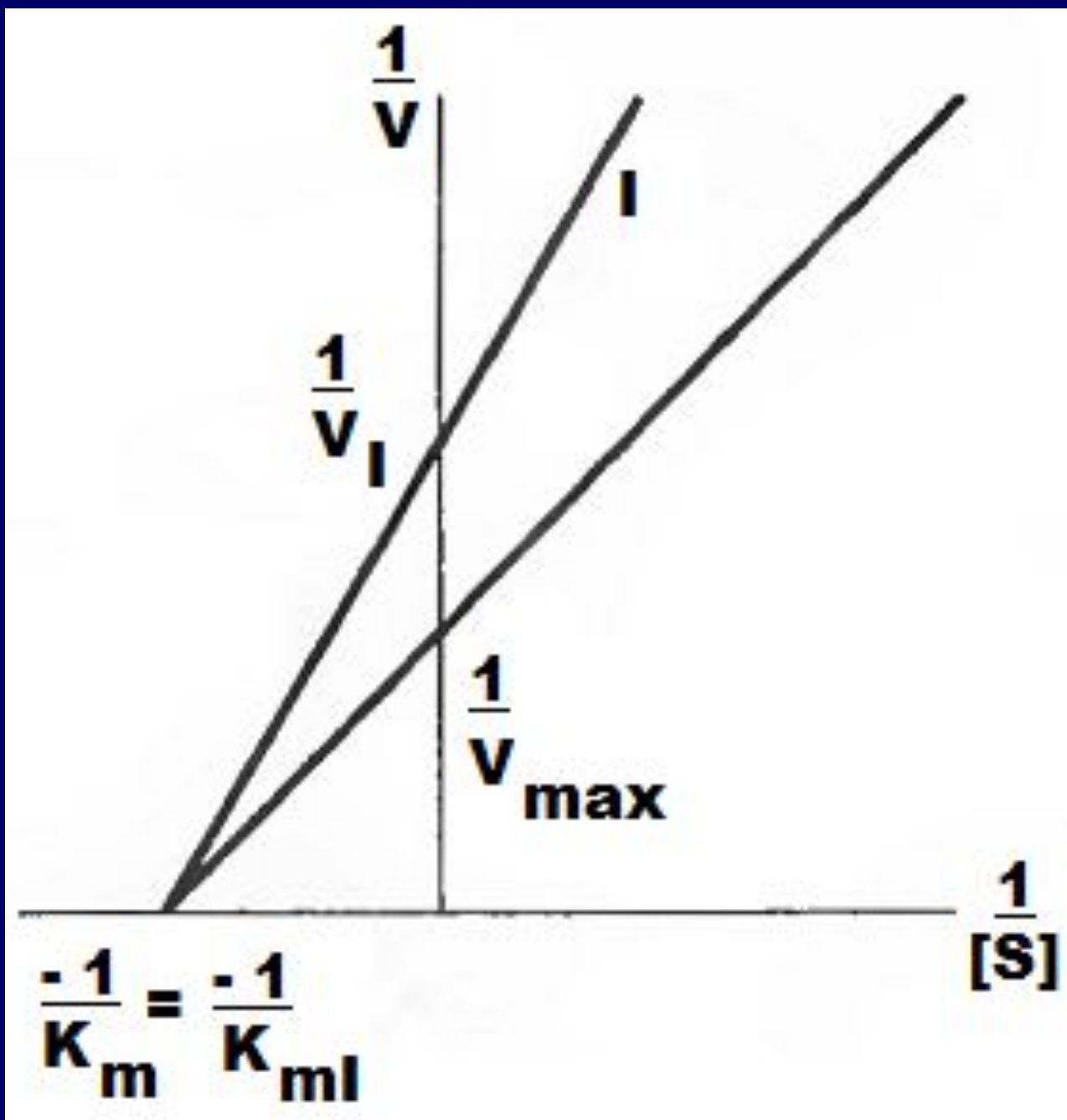




# L'INHIBITION INCOMPETITIVE

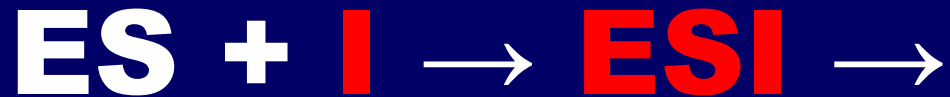


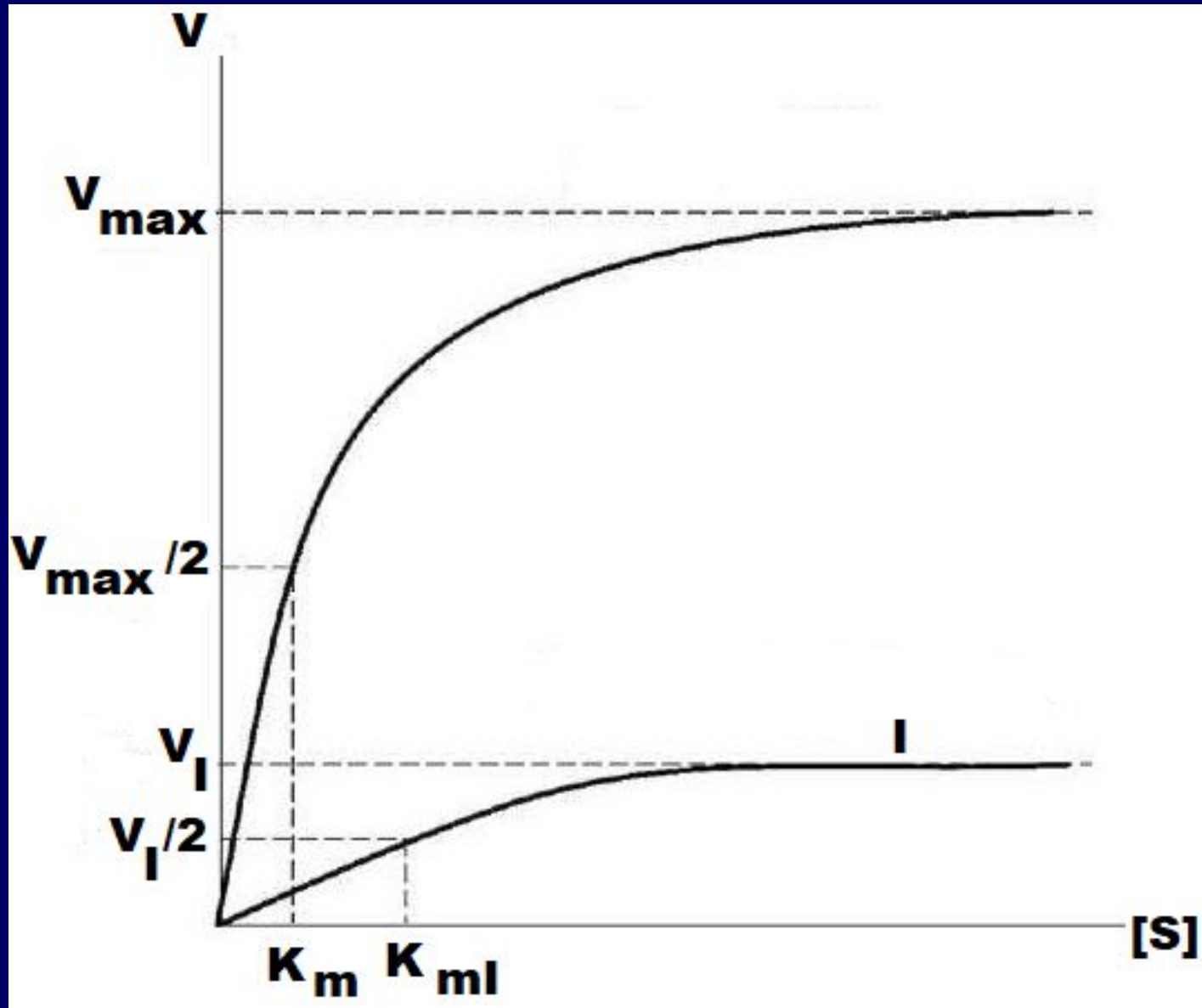


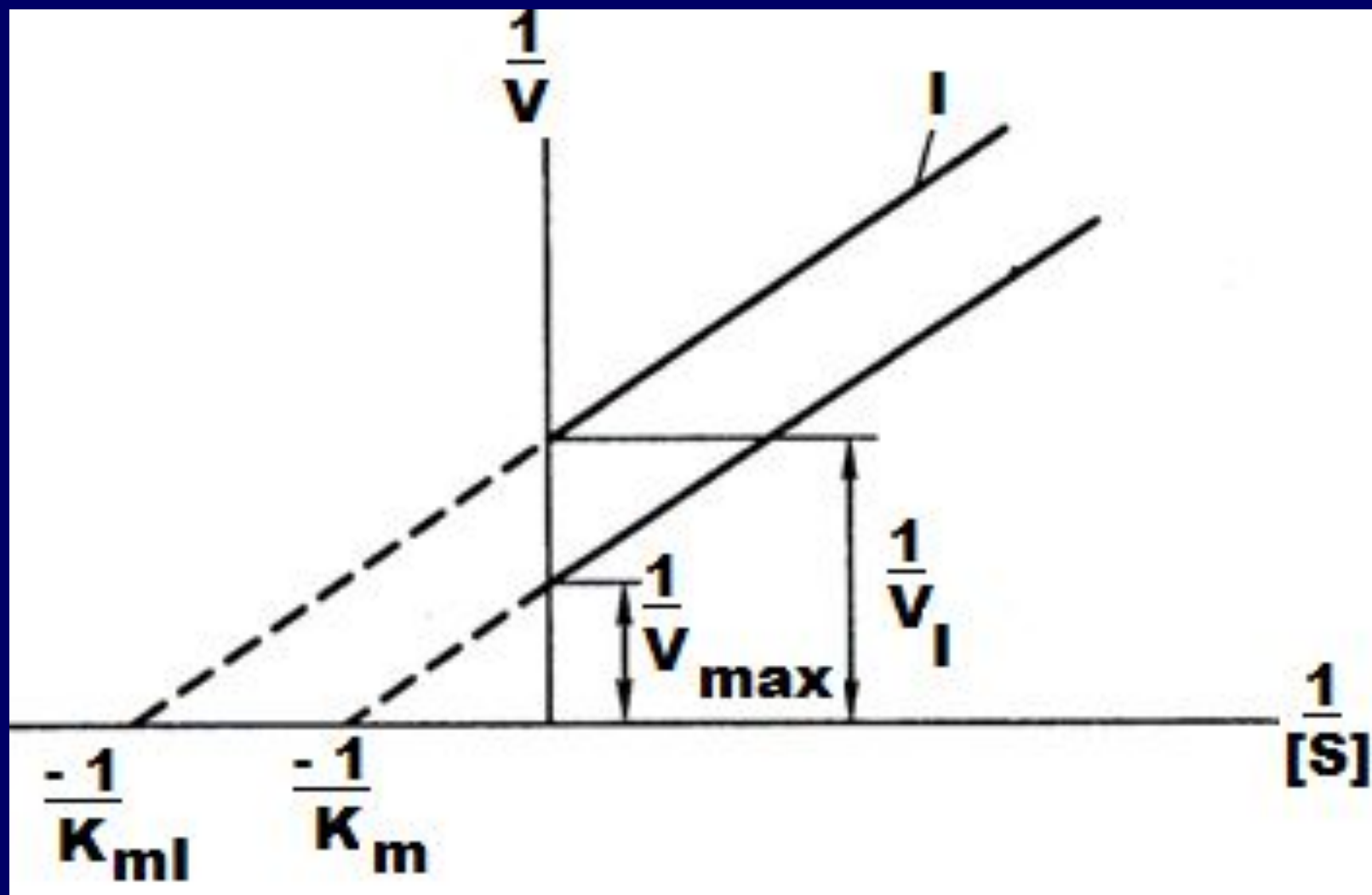




# L'INHIBITION NON COMPETITIVE



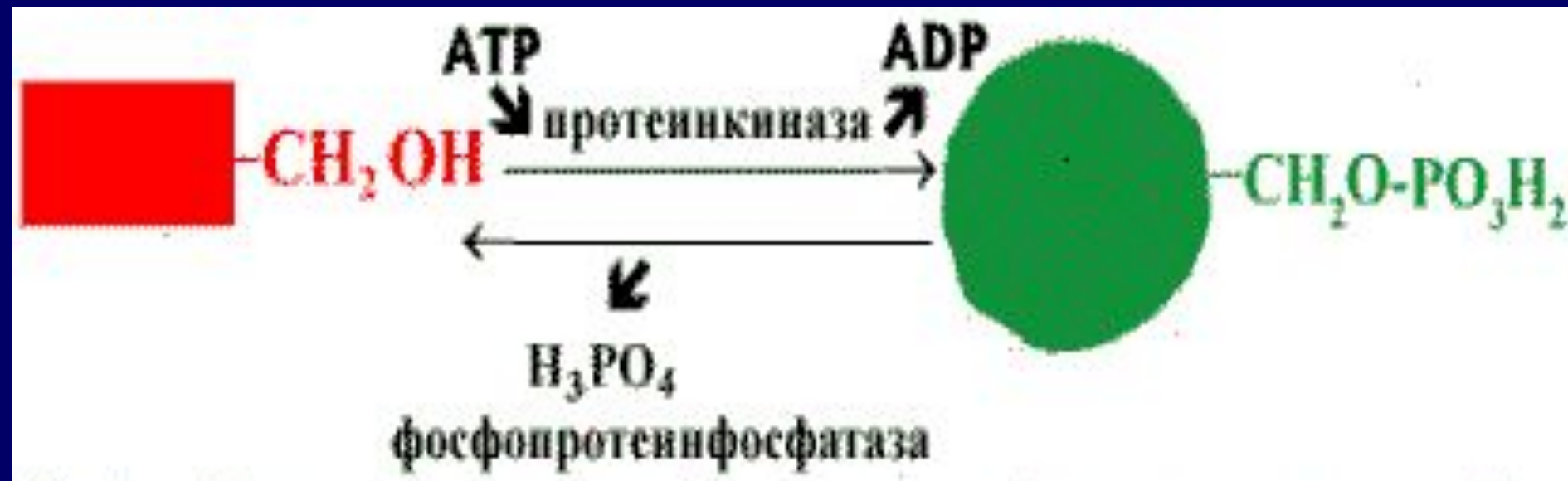




# L'ACTIVATION DE L'ENZYME PAR LA PHOSPHORYLATION

LA LIPASE  
INACTIVE

LA LIPASE  
ACTIVE

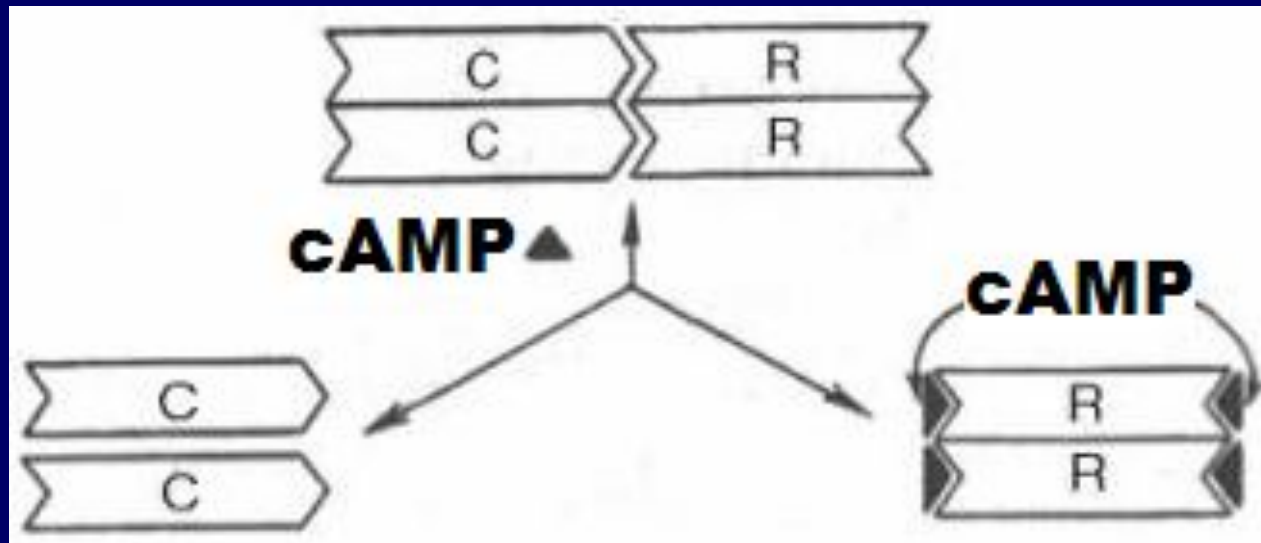


L'ENZYME NON  
PHOSPHORYLEE

L'ENZYME  
PHOSPHORYLEE

# LA REGULATION DE L'ACTIVITE PAR VOIE DE LA DISSOCIATION DES SOUS-UNITES DE L'ENZYME

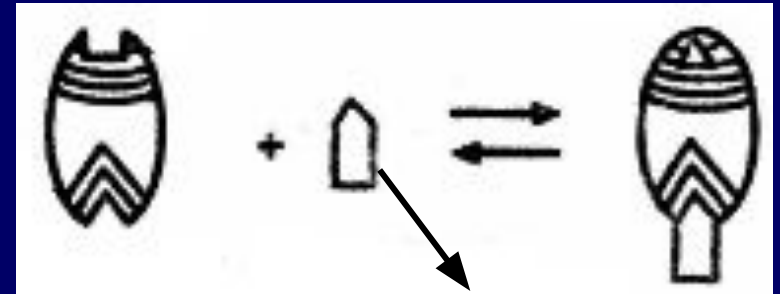
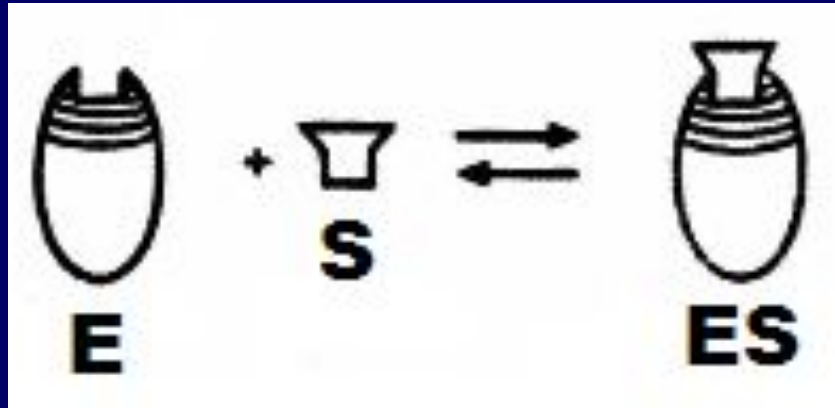
## LA PROTEINE KINASE INACTIVE



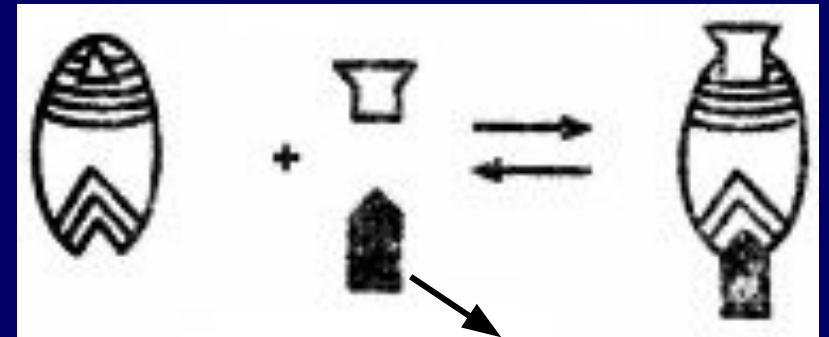
**LES SOUS-UNITES  
CATALYTIQUES  
ACTIVES**

**LES SOUS-UNITES  
REGULATRICES  
INACTIVES**

# LA REGULATION ALLOSTERIQUE



**L'EFFECTEUR  
(NEGATIF)**



**L'EFFECTEUR  
(POSITIF)**

# LES ENZYMES EN MEDECINE

## 1. LES MEDICAMENTS:



## **2. LES REACTIFS ANALYTIQUES:**

<b>Enzyme</b>	<b>Utilisation</b>
<b>Glucose oxydase</b>	<b>Détermination de la concentration de glucose dans le sang</b>
<b>Cholestérol oxydase</b>	<b>Détermination du cholestérol dans le sang</b>



### 3. LES ENZYMES INDICATRICES:

Maladie	Enzyme
Infarctus du myocarde	Créatine kinase, ASAT, LDH-1
Hépatite virale	ALAT, ASAT, glutamate déshydrogénase
Maladies du pancréas	$\alpha$ -amylase
Maladies du foie	ALAT, $\gamma$ -glutamyltransférase