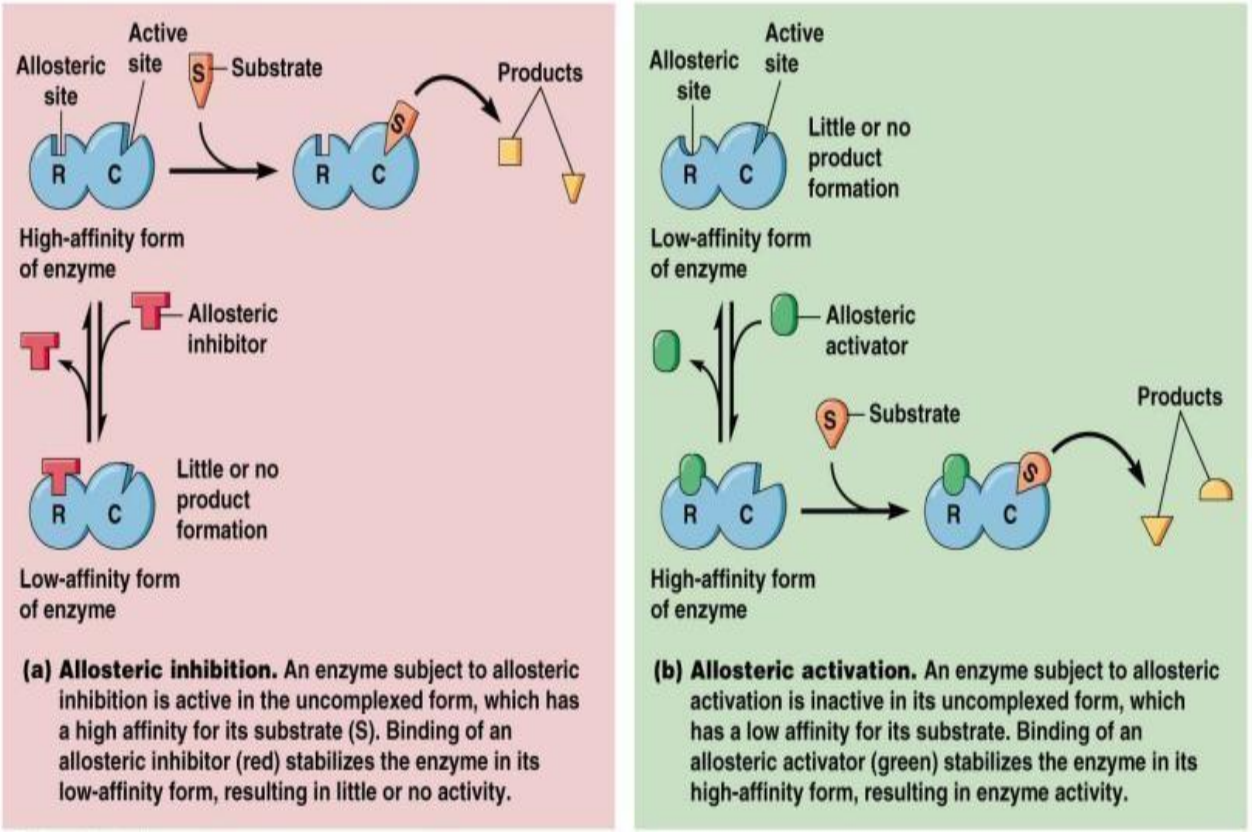
**B.Sc. Botany (Hons) – 2ND SEM**
**by Dr. Raman Kumar Ravi**

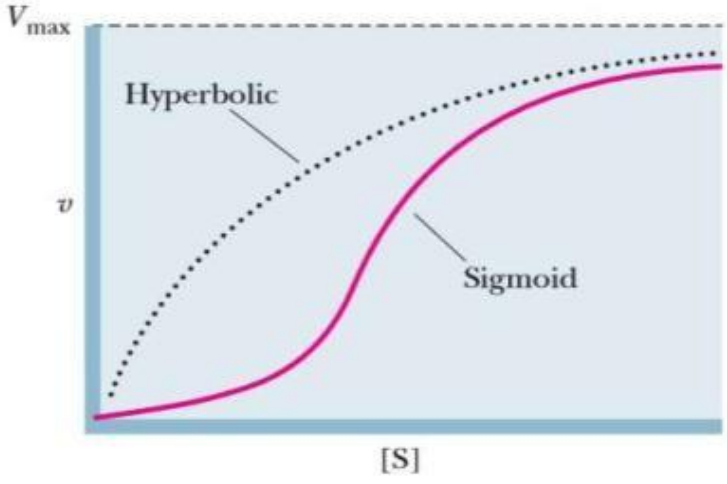
## Enzyme regulation continued-----

### Mechanism of Allosteric regulation




### Kinetics of Allosteric enzymes

One of the common characteristics of an allosteric enzyme is that it shows a sigmoid plot when velocity is plotted against substrate concentration,



Allosteric enzymes generally do not follow the Michaelis-Menten equation.

- The Lineweaver-Burk plot is concave upward.
- Allosteric enzyme show the property of **cooperativity** i.e.,activity at one functional site affects the activity at others.

**Positive cooperativity:** Binding of one site facilities binding of others site.

**Negative cooperativity:** Binding of one site inhibits binding of others site

- A slight change in substrate concentration can produce substantial changes in activity.

**Enzyme regulatory Molecules**

•Enzyme activity may be turned "up" or "down" by activator and inhibitor molecules that bind specifically to the enzyme active site.

• The binding of an activator or inhibitor's is reversible. It means doesn't permanently attach to the enzyme.

**There are two types of Inhibitors mostly affects enzyme activity:**

•An inhibitor that binds to the active site of the enzymes and blocks the binding of the substrate is called **competitive inhibition.** As a result, competitive inhibition increase only the Km, leaving the Vmax the same.

For example Inhibition of the enzyme **succinate dehydrogenase by malonate and** many other pharmaceutical drugs.

• The inhibitor doesn't block the substrate binding to the active site. Instead, it attaches at another site and blocks the enzyme activity. This inhibition is said to be **"noncompetitive Inhibition ". As a results Noncompetitive Inhibitors decreased *V*max but Do Not Affect *K*m.** For example, the action of **pepstatin on enzyme renin**.

**Mechanism of Reversible Inhibitor**