

## The Effect of Enzyme Inhibition on $K_m$ and $V_{max}$

	$K_m$	$1/K_m$	$-1/K_m$	$V_{max}$	$1/V_{max}$	L-B plot slope
Comp. Inhib.	Increases	Decreases	Increases (less negative)	No change	No change	Increases
Noncomp. Inhib.	No Change	No change	No change	Decreases	Increases	Increases
Uncomp. Inhib.	Decreases	Increases	Decreases (more negative)	Decreases	Increases	No change

**Check it out:** The information in this table is best visualized in a double-reciprocal or Lineweaver-Burk plot.

### **Remember:**

The  $K_m$  is a substrate concentration that will allow an enzymatic reaction to go at one half its maximal velocity.

Competitive inhibitors typically resemble substrates and may have  $K_i$  values greater than or less than  $K_m$  for the substrate. Transition state analogs always have a value of  $K_i$  which is much smaller than  $K_m$  (the enzyme has high affinity for the transition state analog.)

Noncompetitive inhibitors do not resemble substrates, and work by inhibiting catalysis rather than substrate binding.

Uncompetitive inhibitors are generally associated with two-substrate reactions in which there is an obligate order of binding; a competitive inhibitor of the second substrate is an uncompetitive inhibitor of the first substrate.