

# Lecture 13: Kinetics II

## Michaelis-Menten Kinetics

Margaret A. Daugherty

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## Enzyme Reactions



E = enzyme

ES = enzyme-substrate complex

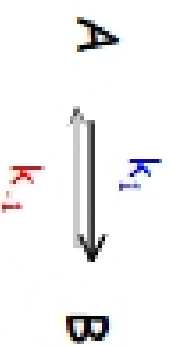
ES\* = enzyme/transition state complex

EP = enzyme product complex

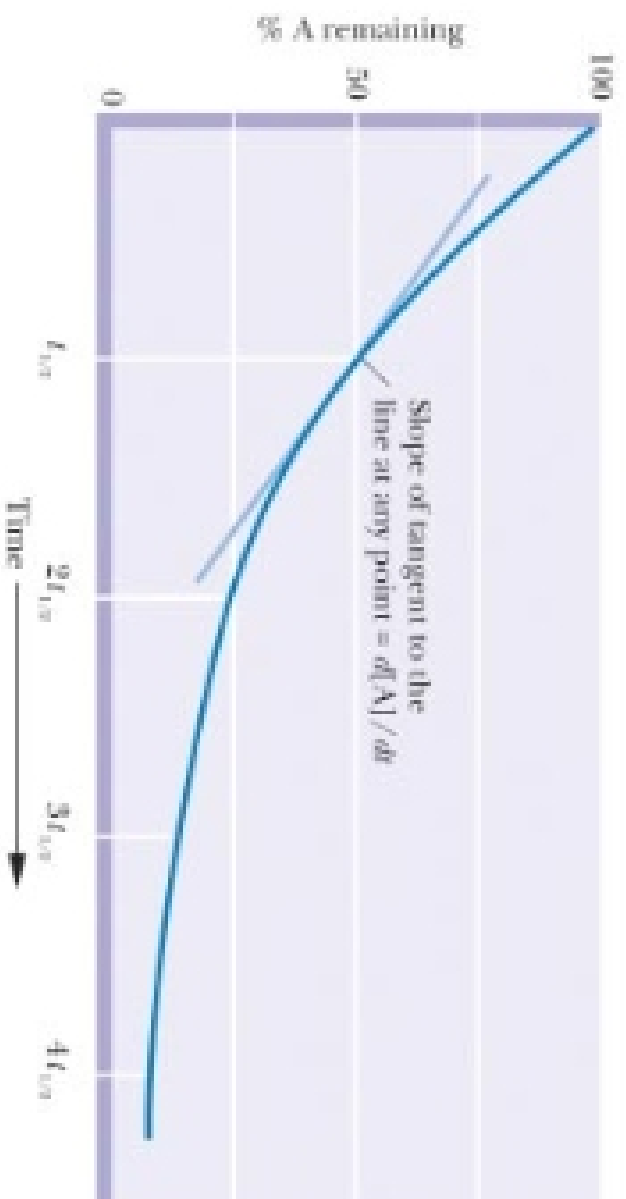
P = product

- Physically interact with their substrates to effect catalysis;
- Substrates bind to the enzyme's **active site**

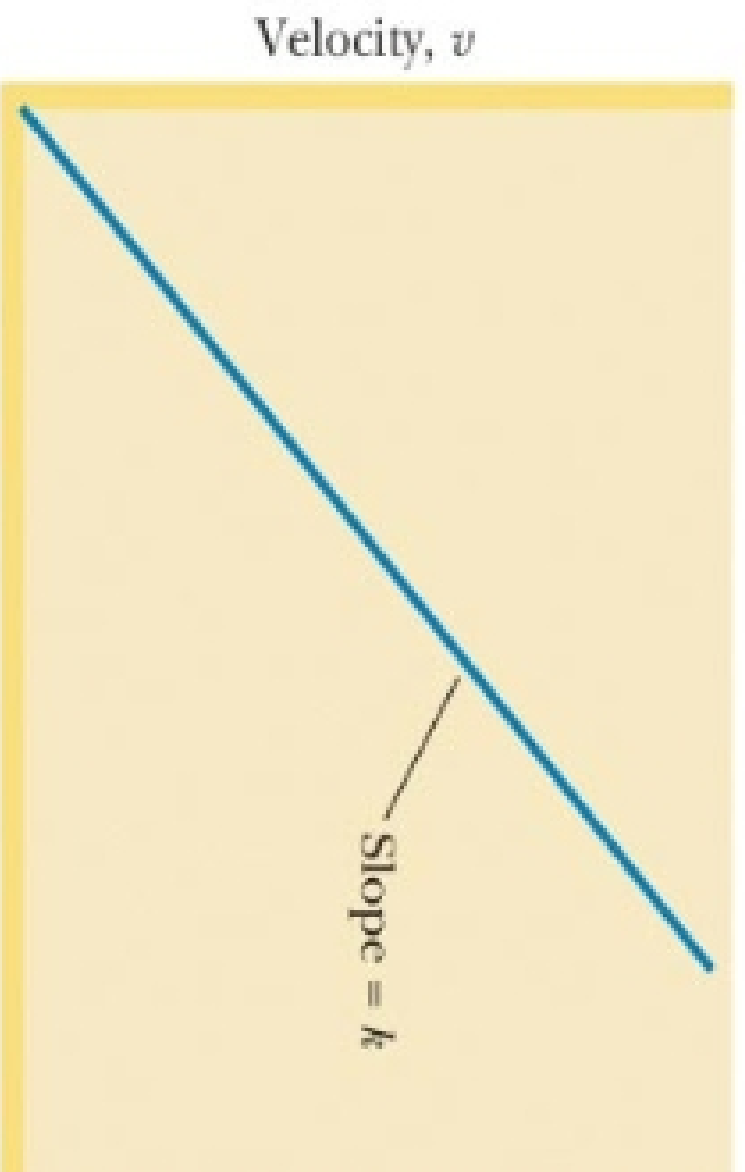
## Return to a simple case: single-order kinetics



rate of disappearance of A:  $v = -d[A]/dt = k[A]$



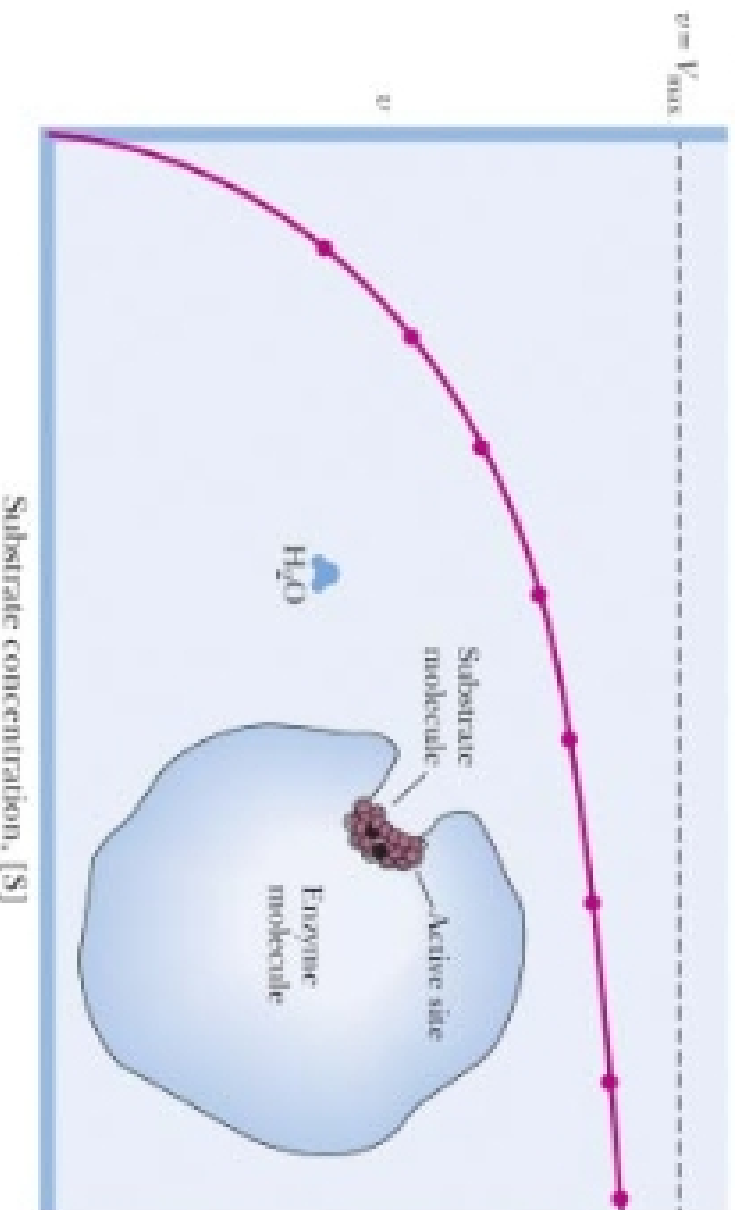
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# Enzyme kinetics: substrate saturation! (substrate saturation curves)

Garrett/Grisham, Biochemistry with a Human Focus  
Figure 16.7



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**Enzyme kinetics: what do we want to know?**

**How well does an enzyme bind a substrate?**

$K_m$

**How fast does an enzyme do its chemistry?**

$V_{max}$

**What is its maximal catalytic activity?**

$K_{cat}$

**How efficient is the enzyme?**

$K_{cat}/K_m$

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