

## CHEM 51 - AN INTRODUCTION TO ENZYMES

### Enzymes

- Enzymes are proteins (10.1)
- Enzymes are biological catalysts (10.1)–
  - They speed up the rate of biological reactions-  $10^6$  X faster than chemical reactions.
  - Specific for one reaction
  - Specific for one type of compound or functional group
- The chemical that the enzyme works on is called the substrate, and their shapes must match – they are chiral = enzyme/substrate complex (10.1)
- This occurs in the active site. (After the reaction the product doesn't fit and is released) (10.1)
- Active site theories (10.1):
  - Lock and key
  - Induced fit
- Factors affecting the reaction rate (10.4)
  - Substrate and/or enzyme concentration (the higher the faster)
  - pH- around 7 is usually best. BUT remember, acids and bases can denature.
  - Temperature-around body temp. is best (40 °C) BUT remember heat will denature.
  - Inhibitors (antibiotics inhibit bacteria enzymes)
- Common enzymes
  - Digestion - mouth, stomach, small intestine (pancreatic enzymes)
  - Meat tenderizer is a digestive enzyme
  - All metabolic reactions require catalyst by enzymes.
  - Named for the reaction or substrate.
    - The enzyme that breaks down amylose is called amylase.
    - Hydrolysis enzymes are hydrolases.
    - Redox enzymes are oxidases.