

BIOLOGY

CONCEPTS & CONNECTIONS
Fourth Edition

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CHAPTER 5 The Working Cell

Modules 5.7 – 5.9

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5.7 The cellular environment affects enzyme activity

- Enzyme activity is influenced by
 - temperature
 - salt concentration (chemical bonds of enzyme are affected by salt ions)
 - pH (enzyme structure is effected by extra hydrogen ions)

- Some enzymes require nonprotein **cofactors** (examples - zinc, iron, copper)
 - Magnesium is a cofactor for the proper functioning of chlorophyll
 - Cofactors which are organic molecules are called **coenzymes**
 - Vitamins are examples of coenzymes

5.8 Enzyme inhibitors block enzyme action

- Inhibitors interfere with enzymes
 - A **competitive inhibitor** takes the place of a substrate in the active site
 - A **noncompetitive inhibitor** alters an enzyme's function by changing its shape

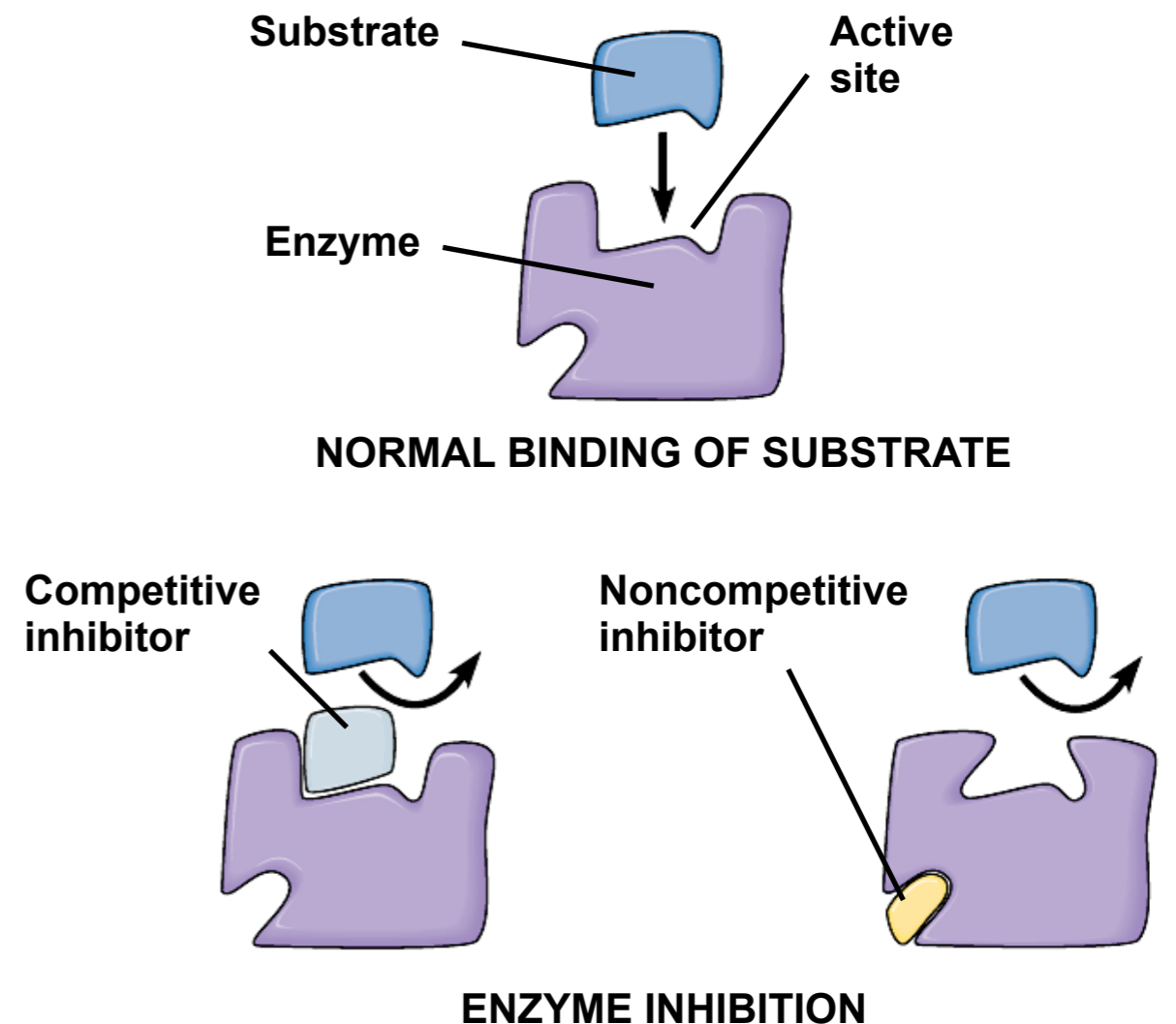


Figure 5.8

- **Negative feedback** is a type of inhibition whereby enzyme activity is blocked by one of the products of the reaction it catalyzes
 - this mechanism regulates the female and male reproductive system

5.9 Connection: Some pesticides and antibiotics inhibit enzymes

- Certain pesticides are toxic to insects because they inhibit key enzymes in the nervous system
 - the insecticide malathion inhibits acetylcholinesterase (prevents nerve cells from communicating)

- Many antibiotics inhibit enzymes that are essential to the survival of disease-causing bacteria
 - Penicillin inhibits an enzyme that bacteria use in making cell walls