

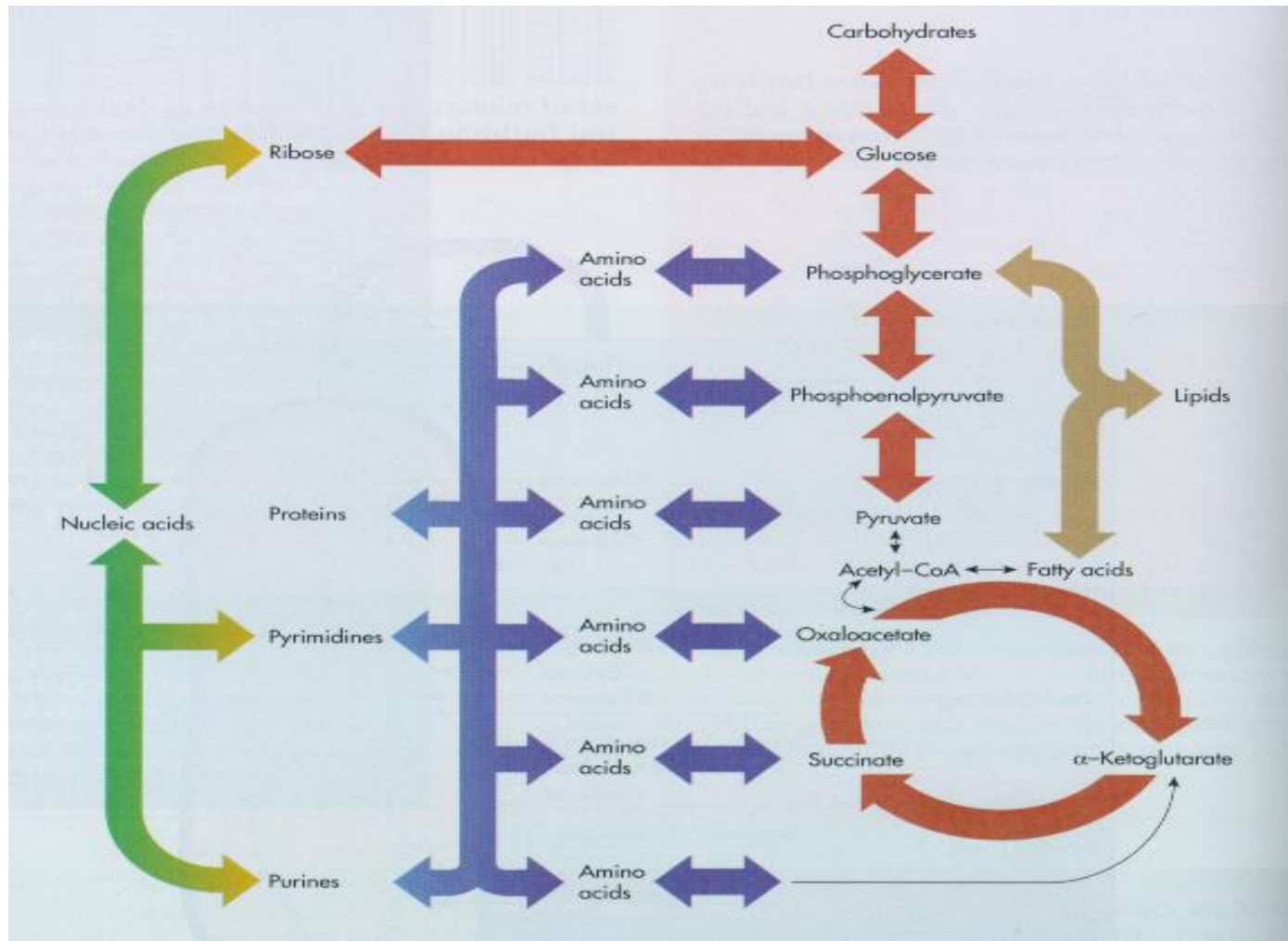
فسيولوجيا الأحياء الدقيقة Microbial Physiology

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مكتب ٢ ب ٤٥

Physiological Adaptation
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Coordination of Metabolic Reactions

❖ The central metabolic pathways:

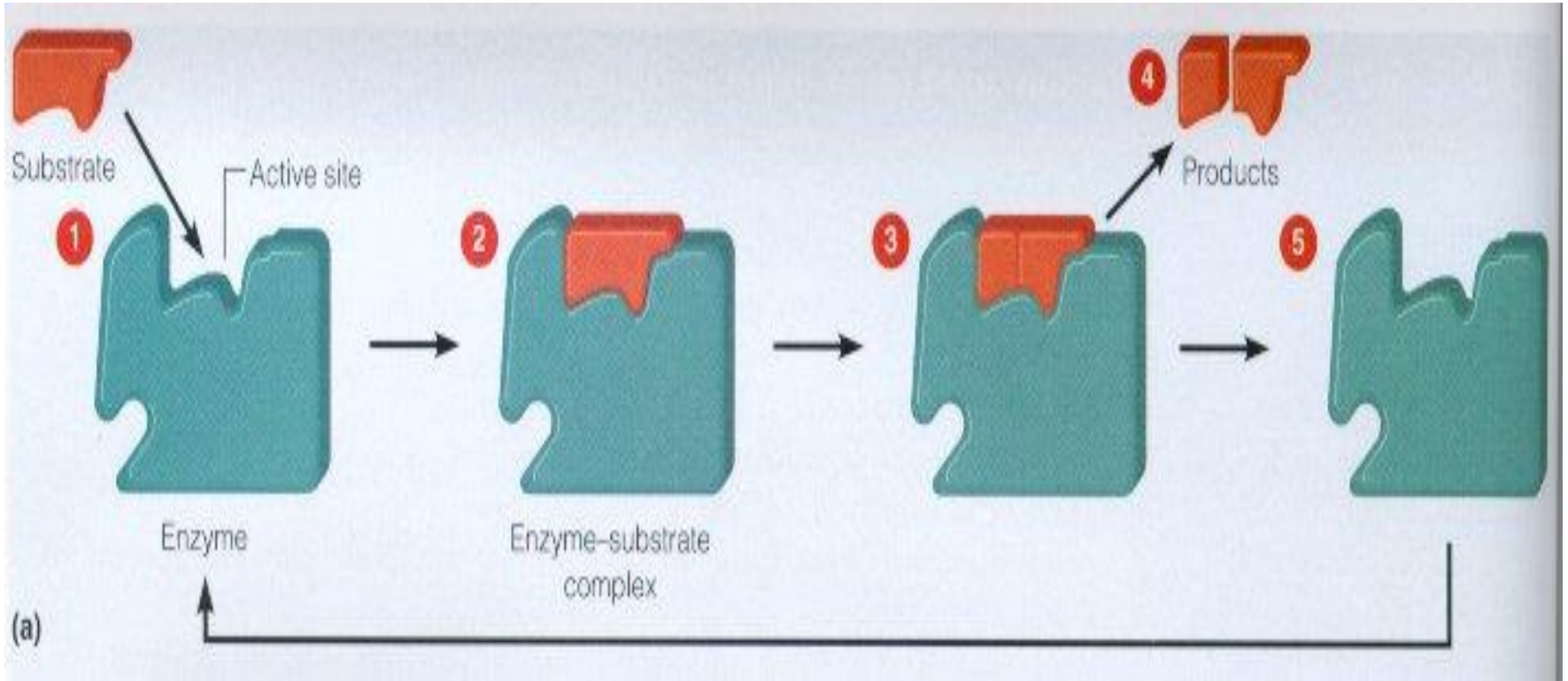


❖ There are fundamentally two ways in which enzyme activity can be regulated within a microbial cell:

- By changing the activity of an enzyme or a protein that is already produced (**inhibition**).
- By effecting the rate at which a protein is produced or, more rarely, degraded (**repression**).

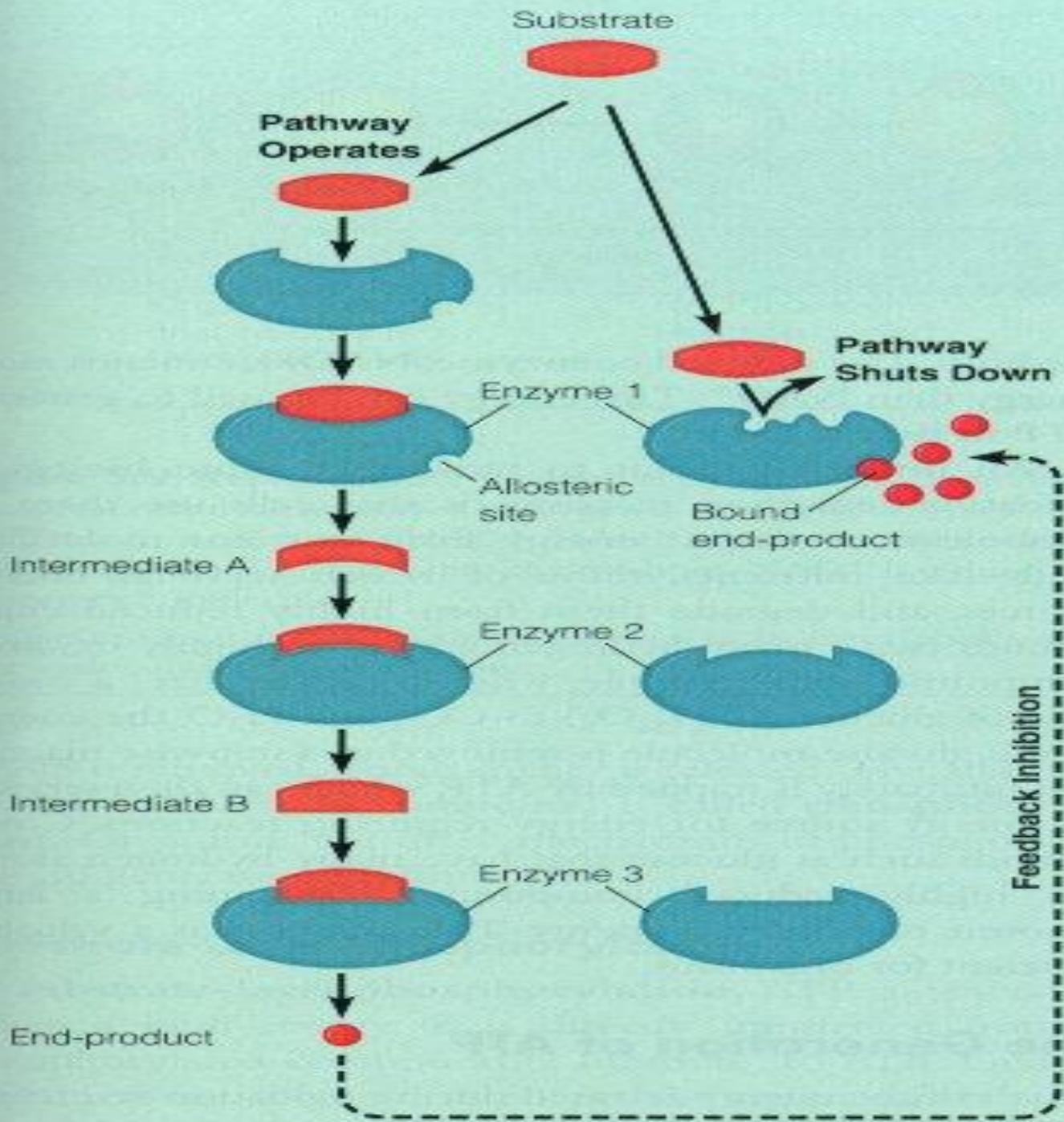
Regulation of Enzyme Activity

- Controlling enzyme activity works on many levels; so proteins can:
 - Be inactivated by covalent modifications such as **phosphorylation**.
 - Have their activities modulated by the reversible association with another molecule. These molecules are termed **ligands** if they are small and **modulators** if they are large.
 - Have their cellular levels determined either by the rate at which the protein is synthesized or, more rarely, the rate that it is degraded.



Regulation of Enzyme Activity

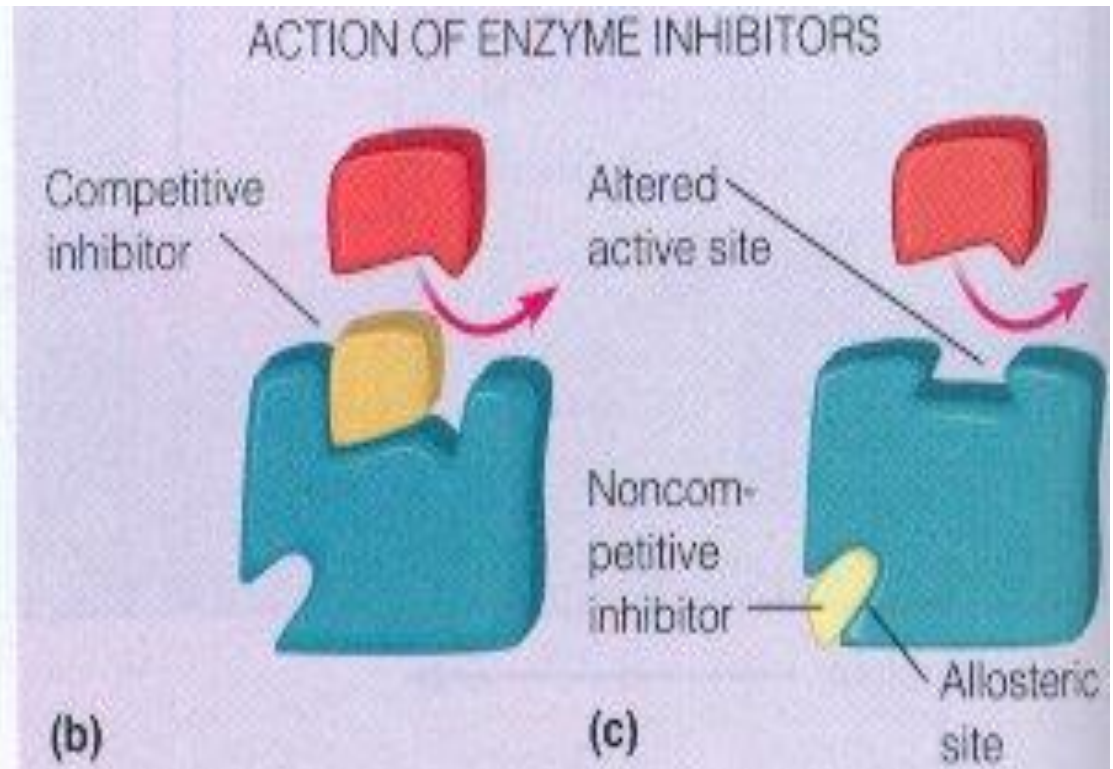
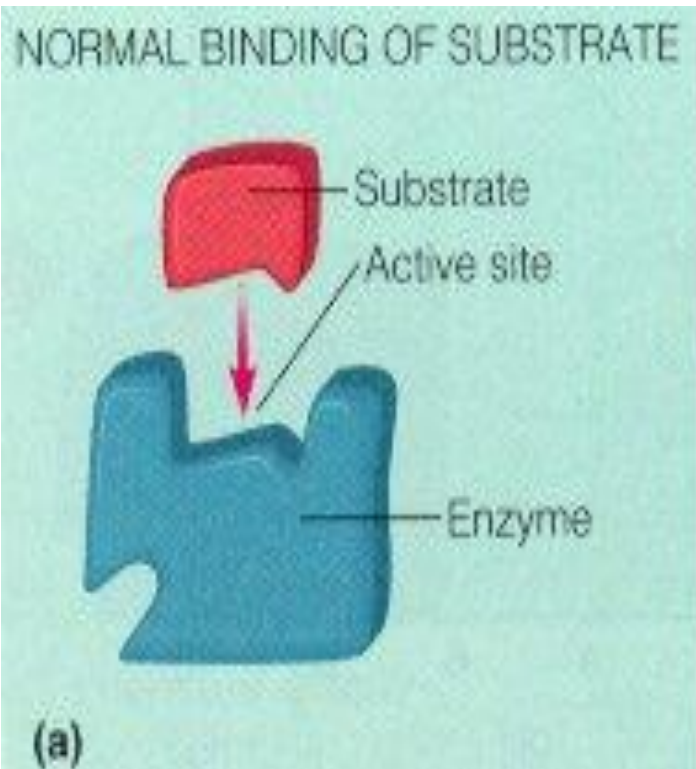
- Allosteric interactions – (The mechanism of regulation).
- It involves the disruption of enzyme activity through allosteric inhibition (the loss of enzyme activity).
- As the result of specific ligand (or allosteric effector) binds to a specific site on an allosteric enzyme.
- Allosteric enzymes have two binding sites:
 - The active site.
 - The second site - allosteric effector binding site.
- Feedback inhibition .



Regulation of Enzyme Activity

- **Competitive inhibition:**

- The substrate and the inhibitor compete for the same active site.



QUESTIONS??

