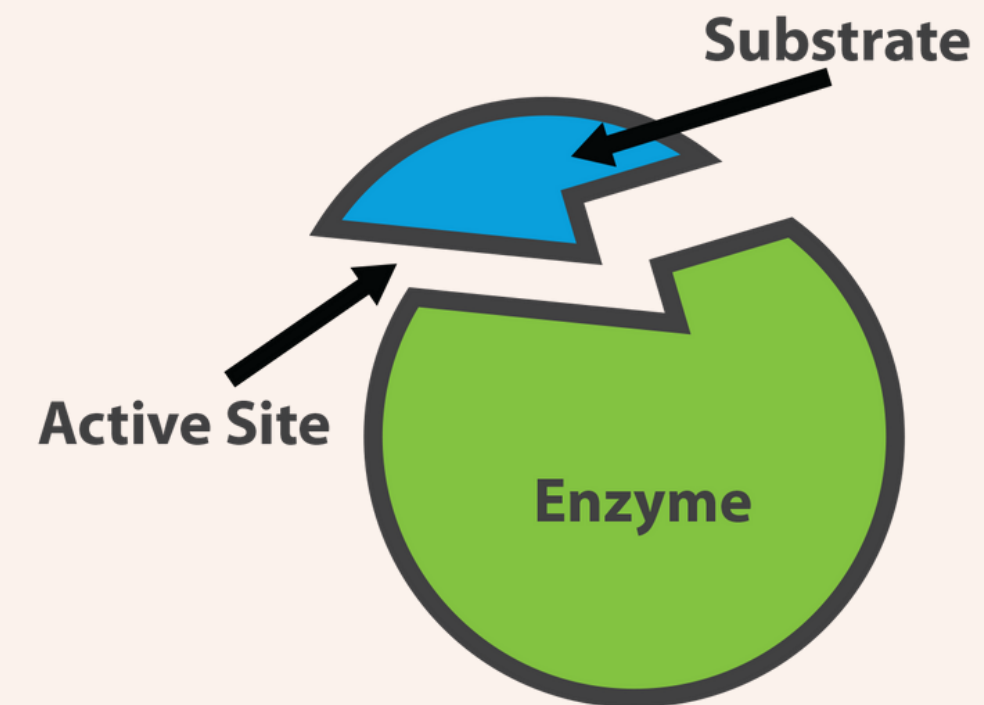


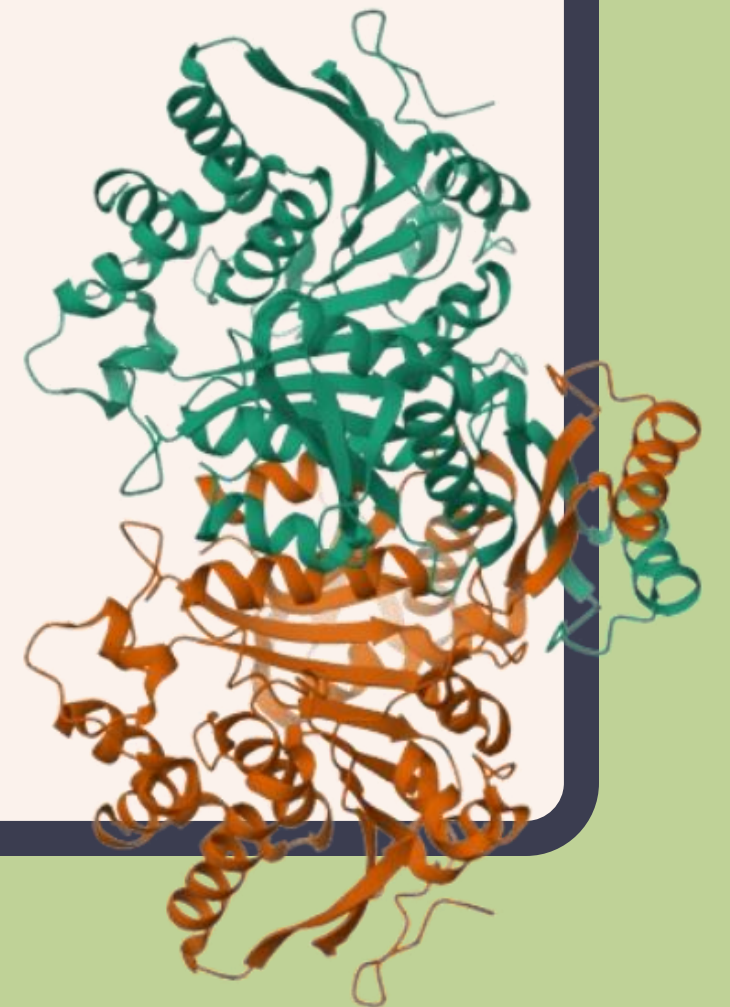
ENZYMES

BIO CATALYSTS



INTRODUCTION

- Enzymes are biological catalysts that speed up the rate of the biochemical reaction.
- They speed up chemical reactions by lowering the activation energy required.
- Most enzymes are 3D globular proteins.



STRUCTURE OF ENZYMES

- The **Active site** of an enzyme is where it binds substrates and other molecules needed for reactions, with specific residues helping to hold them in place.
- Active sites occupy less than 5% of the total surface area of enzyme.
- Active site has a **specific shape** due to tertiary structure of protein.
- A change in the shape of protein affects the shape of active site and function of the enzyme.

Active site



+



→

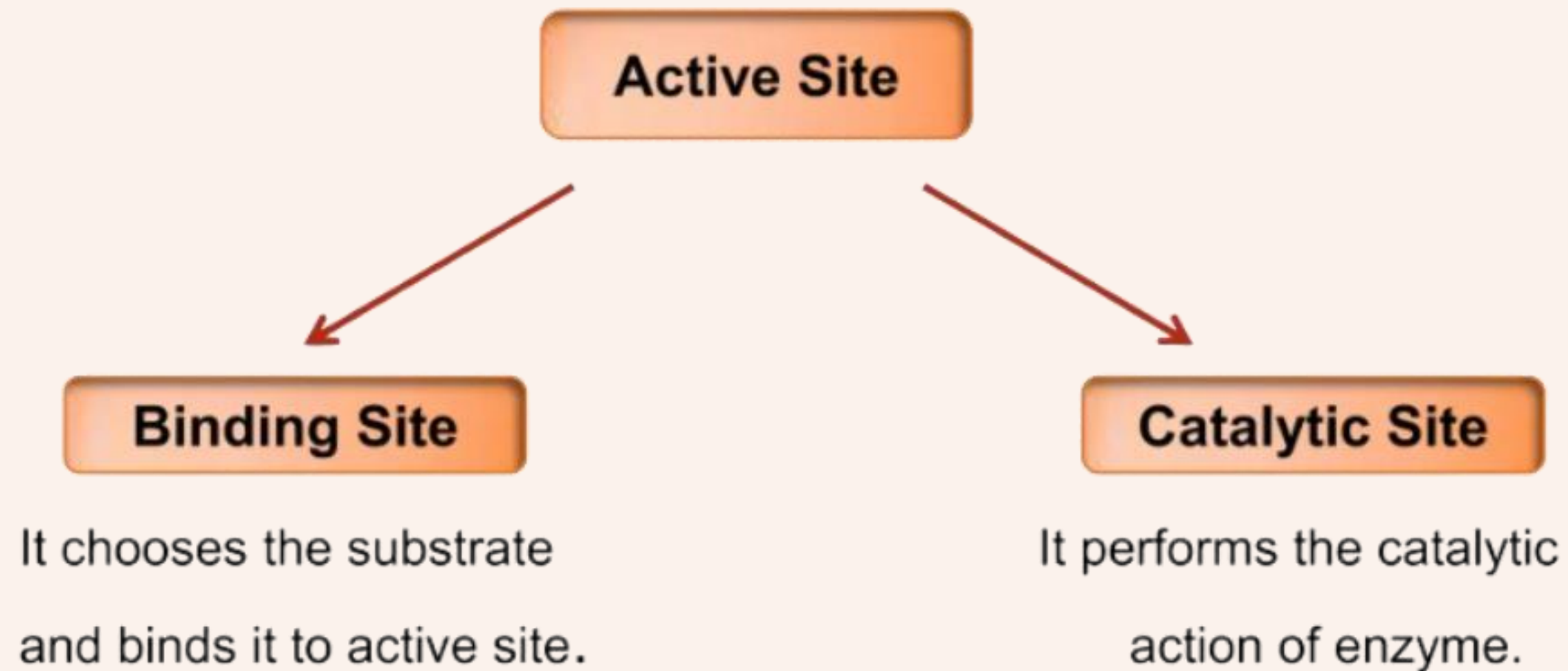


Induced fit model

Enzyme-substrate complex

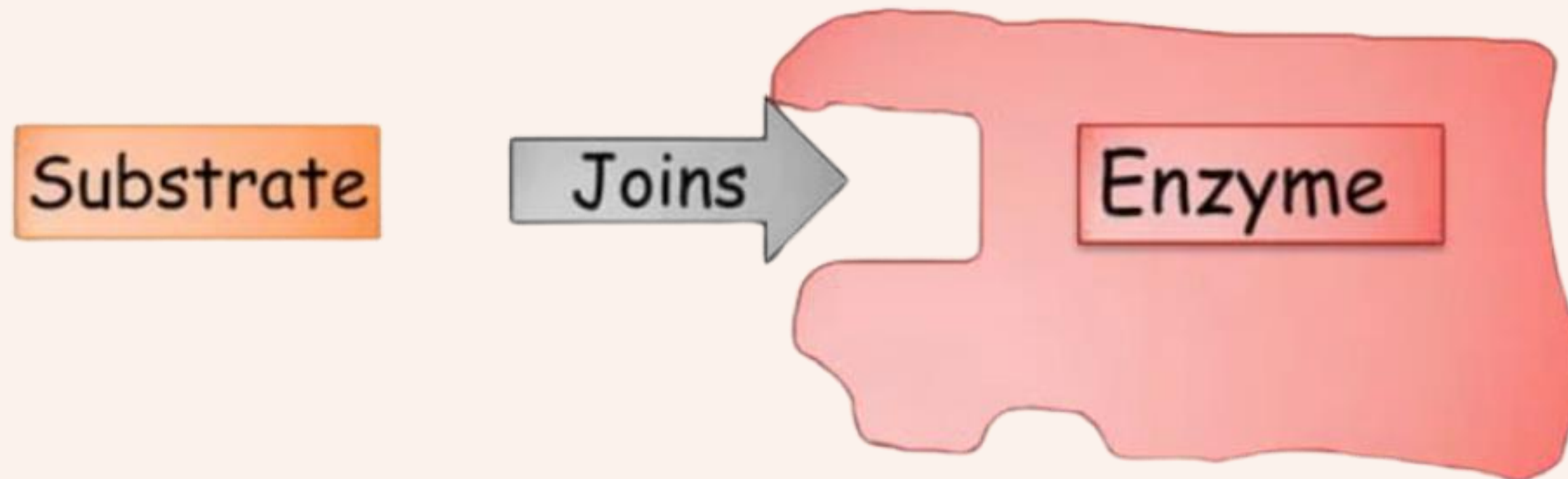
ACTIVE SITE

Active site can be further divided into:



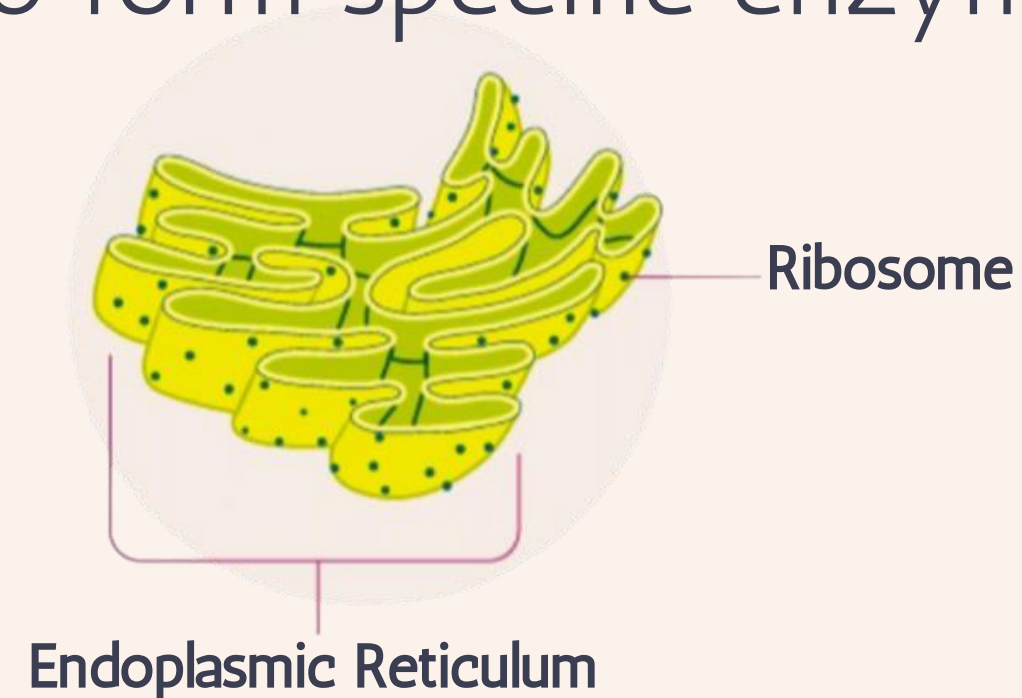
SUBSTRATE

- The reactant in biochemical reaction is termed as **substrate**.
- When a substrate binds to an enzyme it forms an **enzyme-substrate complex**.



SITES OF ENZYME SYNTHESIS

- Enzymes are synthesized by **Ribosomes** which are attached to the rough endoplasmic reticulum.
- Information for the synthesis of enzyme is carried by DNA.
- Amino acids are bonded together to form specific enzyme according to the DNA's codes.

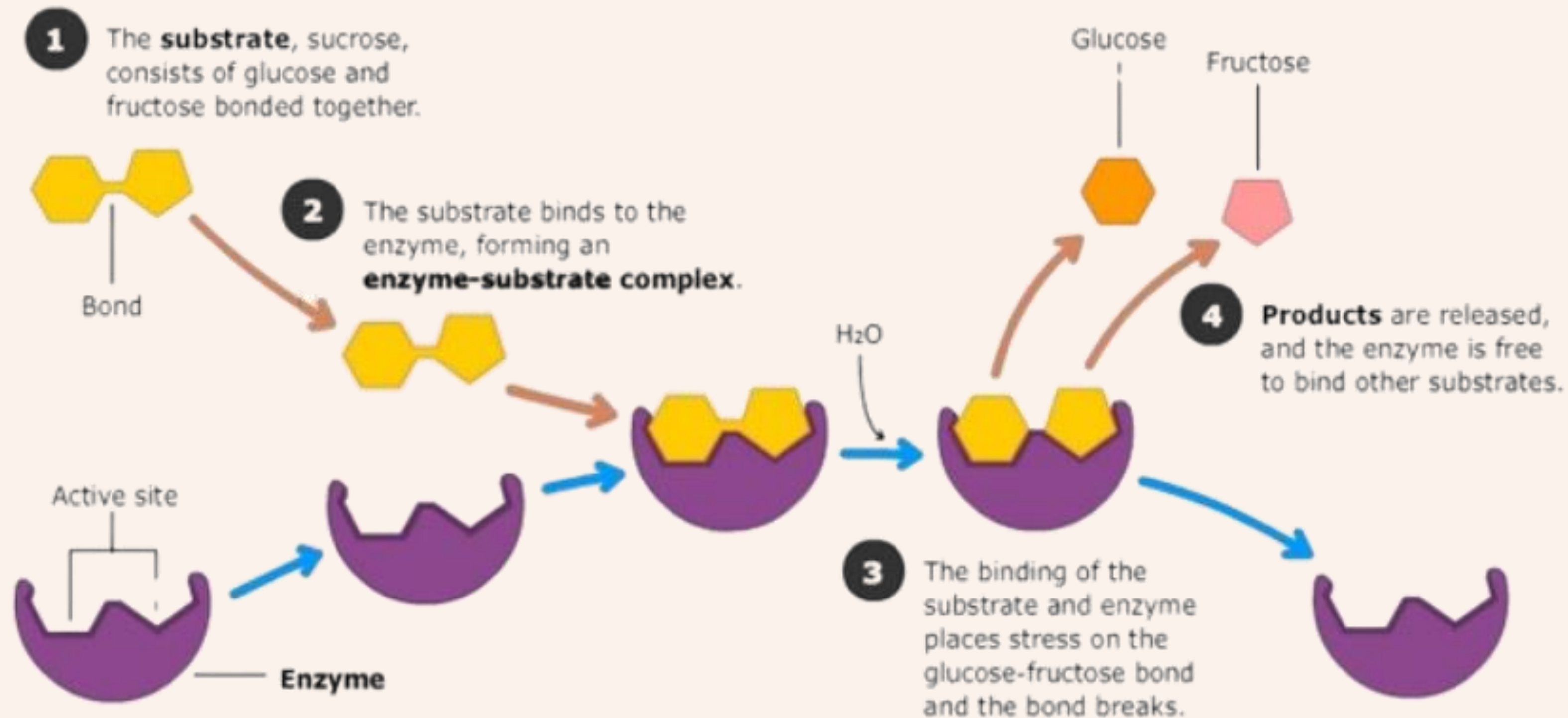


CHARACTERISTICS

- Enzymes **speed up** the reaction by lowering the activation energy of the reaction.
- Their presence **does not effect** the nature and properties of **end product**.
- Small amount of enzymes can accelerate chemical reactions.
- Enzymes are **sensitive** to change in pH, temperature and substrate concentration.
- Each cell contains **thousands** of different enzymes.

NOMENCLATURE OF ENZYMES

- An enzyme is named according to the name of the substrate it catalyses.
- **-ase** is added at last (suffix) of the name of the substrate.
- Examples:
 - maltase
 - lactase
 - lipase
 - amylase



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**THANK
YOU**