

# **Enzyme Cheat Sheet**

by rhettbro via cheatography.com/133961/cs/27509/

#### **Enzymes**

Enzyme Biological molecules (proteins)
that act as catalysts and help
complex reactions.
are specific to their substrates

are specific to their substrates and each enzyme has its own optimum pH

Substrate Material upon which an enzyme acts.

Enzyme important in normal metabolism inhibition for control of pathways.

#### Reversible inhibitor

competitive and shape with the substrate inhibition

noncompetitive doesn't mind whether there is a inhibition substrate or not. but when the inhibitor binds, it switches off catalysis.

uncomp- (Lowers Vmax and Km) the etitive inhibitor can ONLY be on the inhibition surface of the enzyme if the substrate is there.

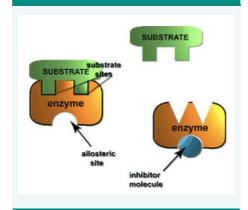
Irreversible enzyme protein, usually at the
inhibitor active site(substrate site), to
permanently block activity.

Vmax is the maximum rate of an enzyme catalysed reaction i.e. when the enzyme is saturated by the substrate.

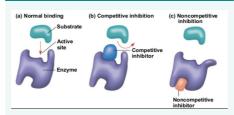
Km is measure of how easily the enzyme can be saturated by the substrate.

Km and Vmax are constant for a given temperature and pH and are used to characterise enzymes. They can be used to identify types of inhibitors i.e. competitive, non-competitive and uncompetitive.

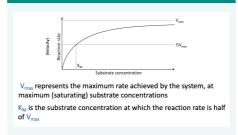
### Allosteric site



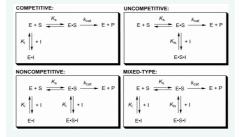
# Normal binding



#### **Enzyme kinetics**



#### Reversible inhibition



## Enzyme in human digestion

Three main types of enzymes in human digestion:

Amylases break down carbohydrates
Example: salivary amylase

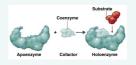
Substrate: starch Product maltose
Source: mouth (salivary glands)
Optimum pH: 7-7.8

Proteases break down polypeptides
Example: posin

Substrate: polypeptides Product: amino acids
Source: stomach
Optimum pH: 2

Lipases break down fast and lipids
Example: pare lipids
Example: pare lipids
Substrate: triglycerides Product fatty acids & glycerol
Source: pancreas, delivered into small intestine
Optimum pH: 7.2 - 7.5

### with co-enzyme



#### CoFactor

In the case of metal ion cofactors

Stabilise the Ca++ with some structure, not proteinases directly involved in

part of substrate Mg++-ATP with some kinases

part of active site Zn++ in alcohol dehydrogenase

Organic cofactors

the chemistry

coenzymes they do come on and

off like other substrates (NAD+)

**prosthetic groups** a cofactor that forms

a permanent part of the enzyme's active

site.

Doesn't come on and off in a catalytic cycle (FAD,PLP)

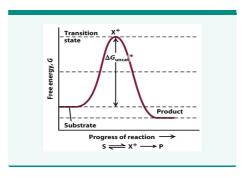
## NAD+ is both a coenzyme and a substrate

Why use coenzyme in one case and not in the other case?

Metabolic point: NAD is one of a range of cofactor substances that is present in small concentration

They turn over and over again to process a large amount of substances

Pathway is to process large amount with tiny amount of coenzyme



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