

INTRODUCTION

- **Xenobiotics**- substances foreign to body
- include- Drugs, Processed food, Food additives, Cosmetic products, Environmental pollutants, Agrochemicals,
- Phytoalexins (dietary plant toxins)

Biotransformation needed for detoxification & protect the body from ingested toxins.

Definition

- Chemical alteration of drug in the body.
- ***Non polar lipid soluble*** compounds are made ***polar lipid insoluble***, so that they are easily excreted.
- Drugs which do not undergo biotransformation – Streptomycin, neostigmine....(highly polar drugs)
- **SITES**
 - Primary site – Liver
 - Others – Kidney, Intestine, Lungs, Plasma...

Drug Biotransformation –

convert lipophilic / hydrophobic drug
(to enter cells) to hydrophilic
metabolites.

Advantages

- Termination of drug action - (↓ toxicity)
- Reduced lipophilicity.
- Renal / biliary excretion ↑ - (↓renal reabs)

➤ Absorbed drugs – 3 changes

➤ Metabolic changes by Enzymes

(Microsomal, Cytoplasmic, Mitochondrial)

➤ Spontaneous Molecular rearrangement –
HOFMANN ELIMINATION

➤ Excreted unchanged (highly polar drugs) -
Aminoglycosides, Methotrexate, Neostigmine

CONSEQUENCES

➤ **A) Drug inactivation - inactive or less active**

Propranolol, Pentobarbitone, Morphine,
Chloramphenicol, Paracetamol, Ibuprofen,
lignocaine

➤ **B) Active drug to Active metabolite- active metabolite**

Effect is due to parent drug and its active metabolite

Phenacetin	-	Paracetamol
Phenyl butazone	-	Oxyphenbutazone
Primidone	-	Phenobarbitone
Diazepam	-	Desmethyl diazepam
Digitoxin	-	Digoxin
Imipramine	-	Desipramine
Amitriptyline	-	Nortriptyline
Procainamide	-	N Acetyl procainamide
Codeine	-	Morphine
Spironolactone	-	Canrenone
Allopurinol	-	Alloxanthine
Cefotaxime	-	Des acetyl cefotaxime
Morphine	-	Morphine 6 glucuronide

➔ C) Inactive drug (Prodrug) - Active drug

Prodrugs are inactive drugs which need BT in the body to form active metabolites.

❖ ADV

- More stable
- Better BA
- Less toxicity

Levodopa	- Dopamine
Enalapril	- Enalaprilat
α Methyl dopa	- α Methyl Norepinephrine
Dipivefrine	- Epinephrine

Proguanil

- Proguanil triazine

Prednisone

- Prednisolone

Bacampicillin

- Ampicillin

Sulfasalazine

- 5-amino salicylic acid

Cyclophosphamide

- Aldophosphamide

Mercaptopurine

- Methyl Mercaptopurine

Prontosil

- Sulfanilamide

Acyclovir

- Acyclovir triphosphate