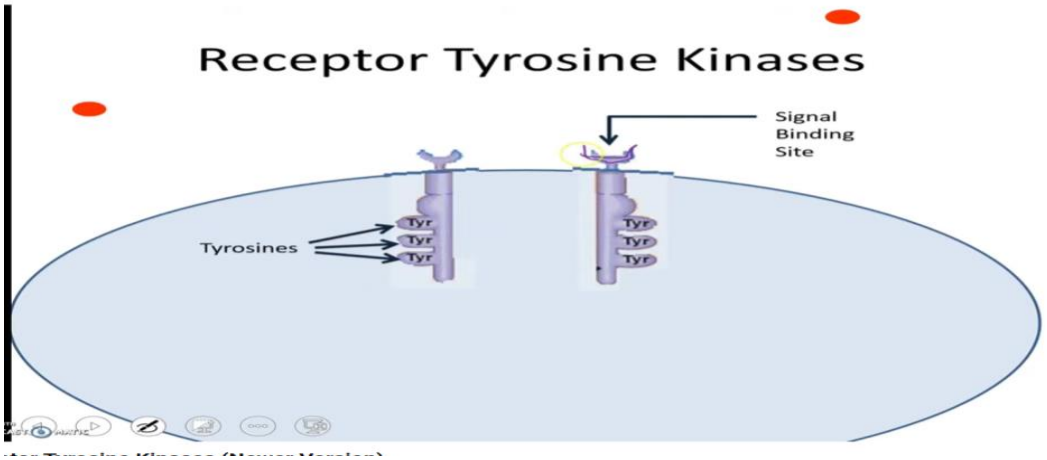
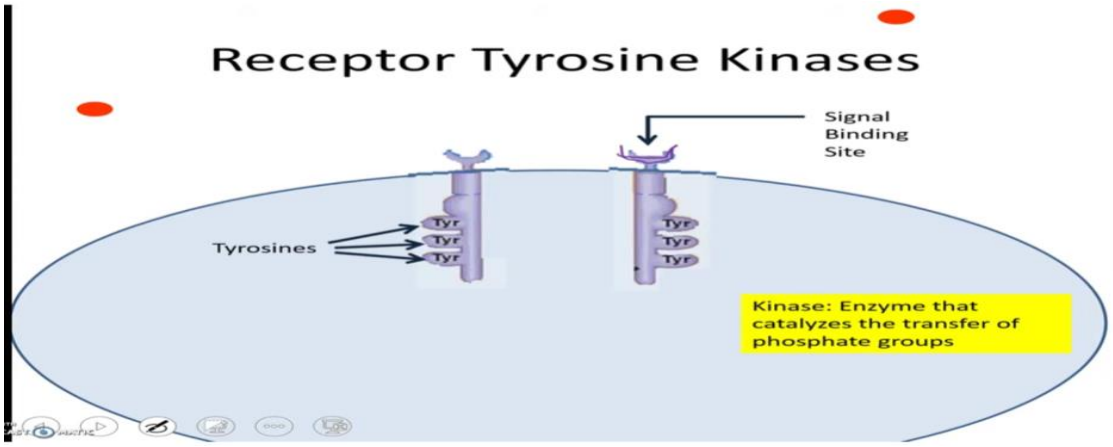
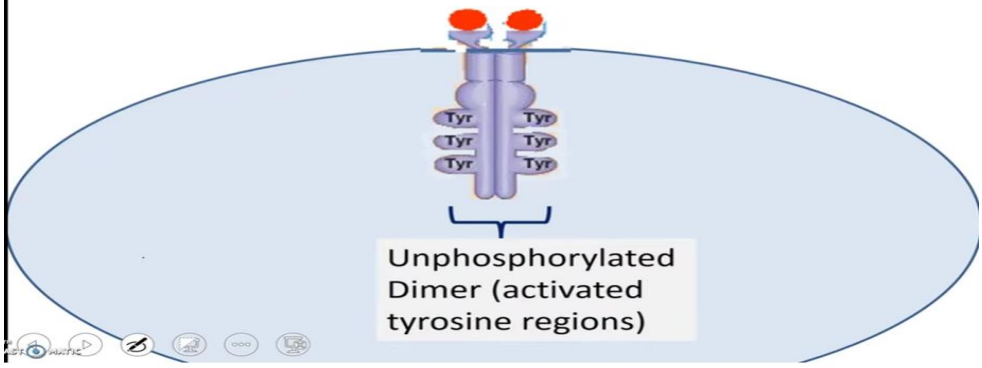
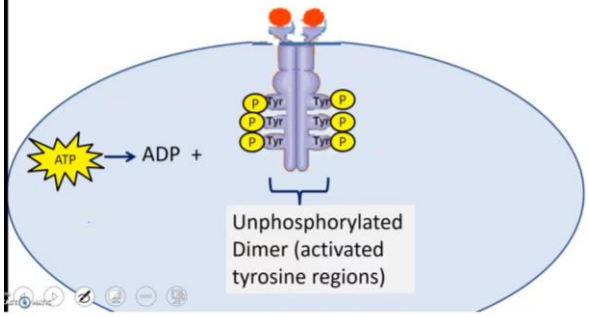

Receptor Tyrosine Kinases
Signal
Binding
Site
Tyrosines
Tyr
Tyr
Tyr
Tyr
Tyr
Tyr


Receptor Tyrosine Kinases
Signal
Binding
Site
Tyrosines
Tyr
Tyr
Tyr
Tyr
Tyr
Tyr
Kinase: Enzyme that
catalyzes the transfer of
phosphate groups

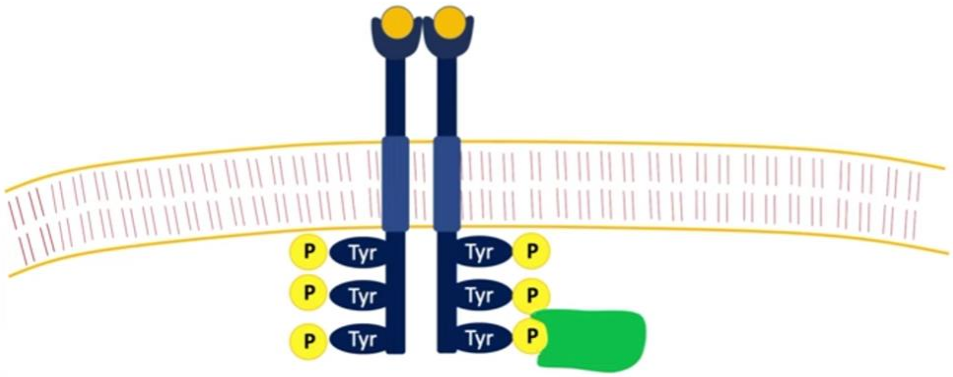
Receptor Tyrosine Kinases

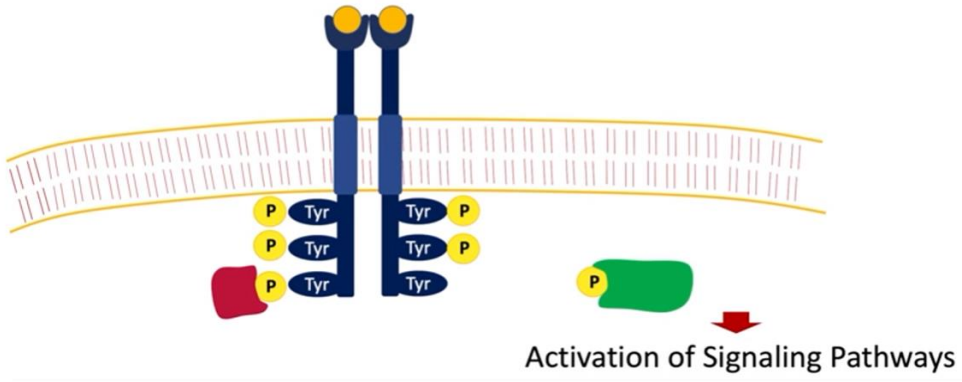


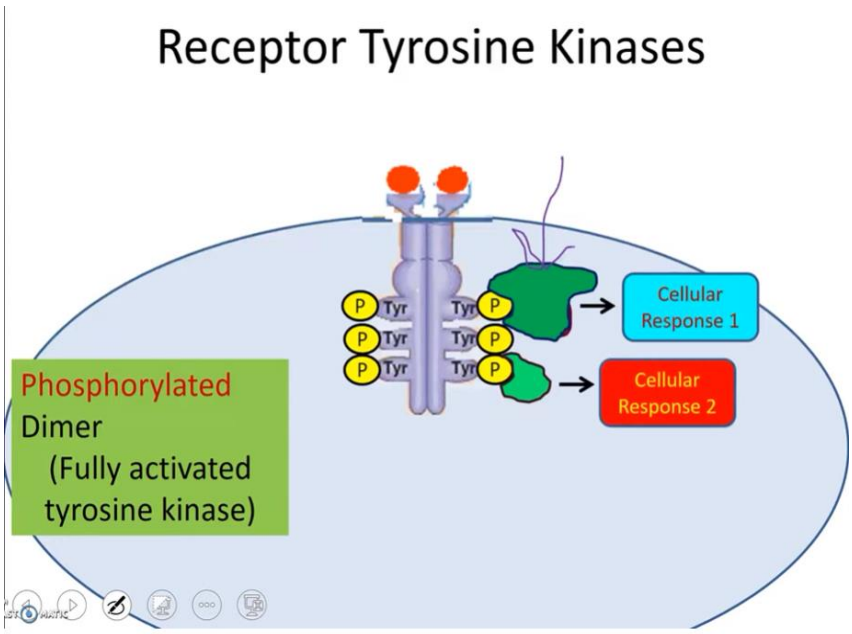
Receptor Tyrosine Kinases

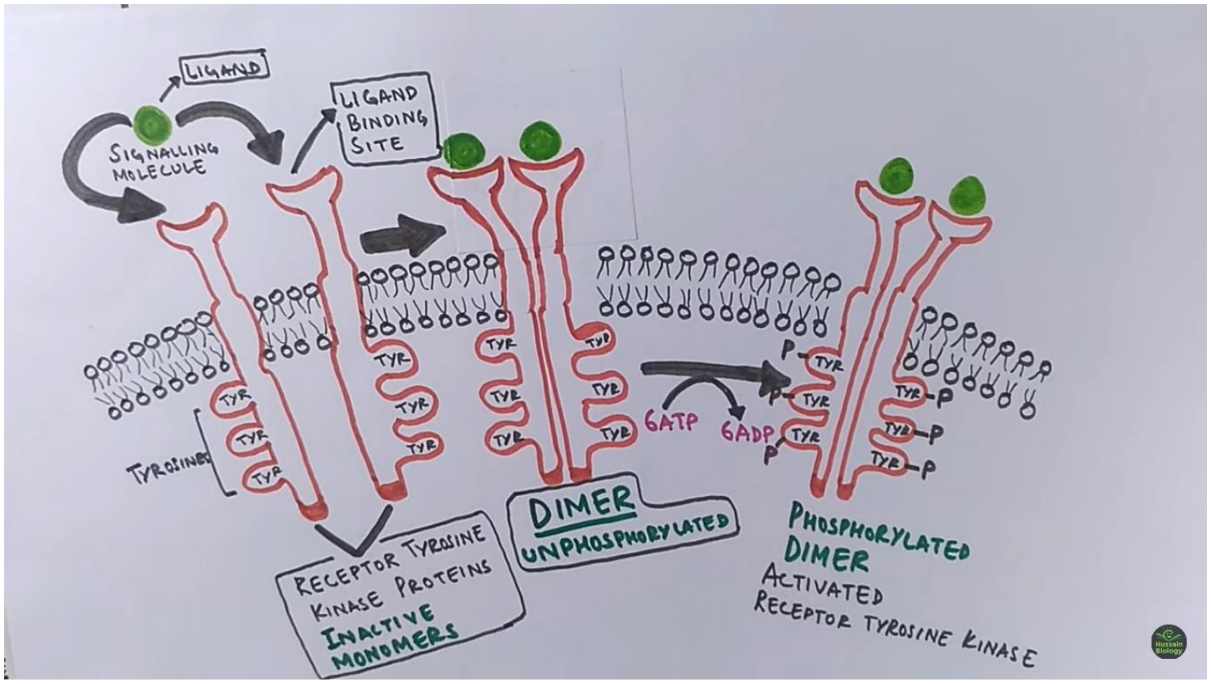


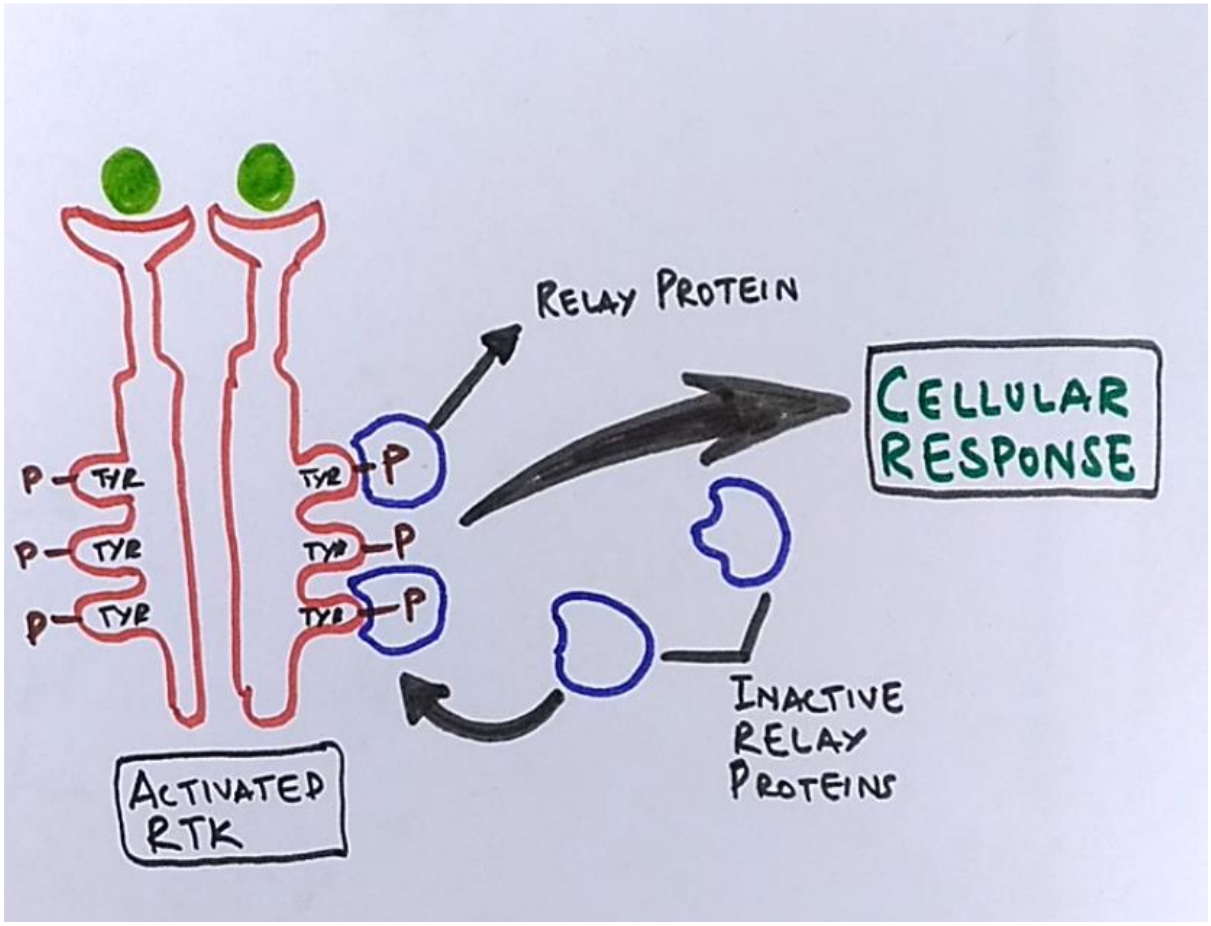
tor Tyrosine Kinases (Newer Version)

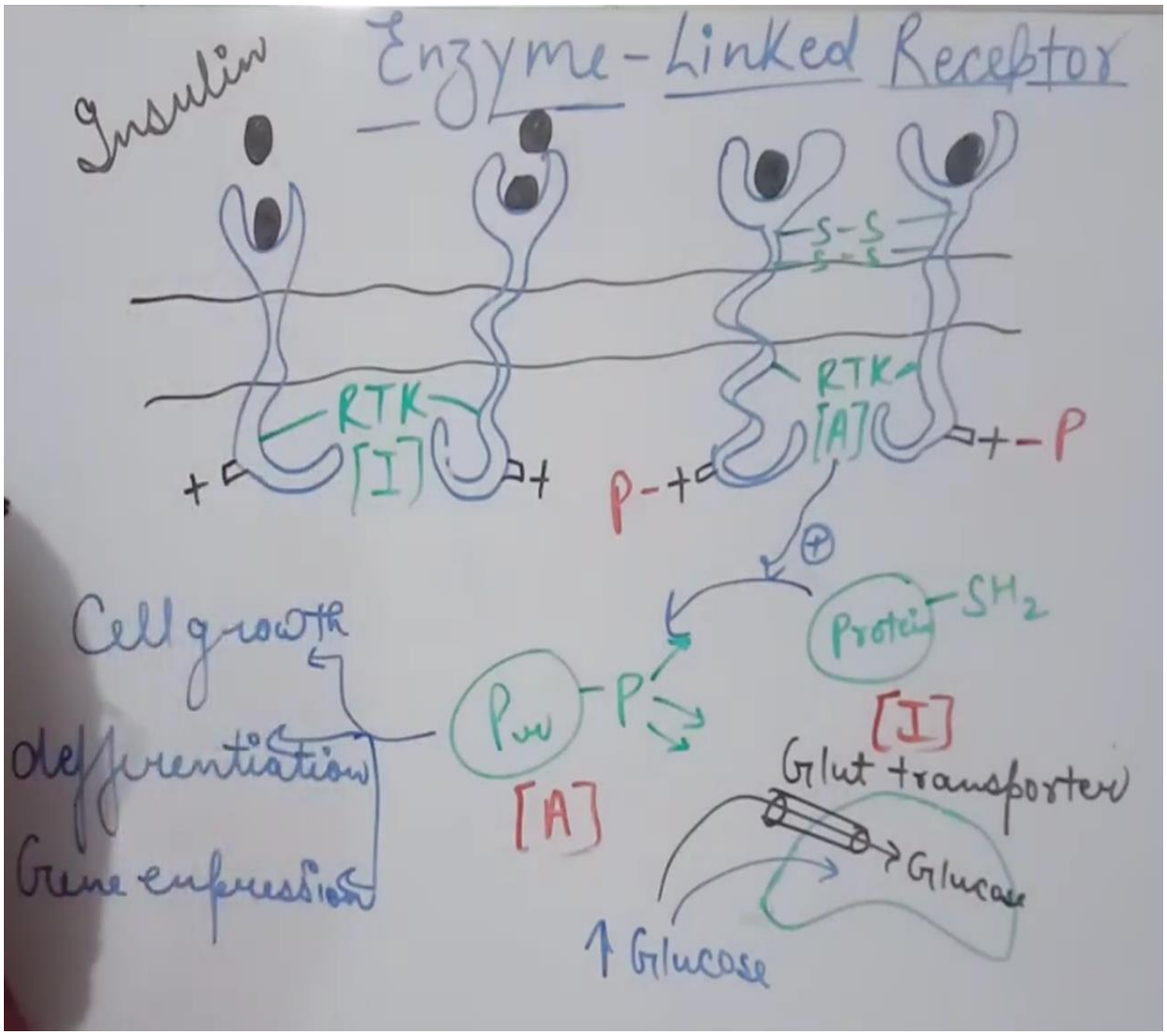

P
Tyr
SH2 Domain Protein


P
Tyr
Activation of Signaling Pathways


Receptor Tyrosine Kinases
Phosphorylated
Dimer
(Fully activated
tyrosine kinase)
P
Tyr
Cellular
Response 1
Cellular
Response 2


LIGAND
SIGNALLING MOLECULE
LIGAND BINDING SITE
TYROSINES
TYR
RECEPTOR TYROSINE KINASE PROTEINS
INACTIVE MONOMERS
DIMER
UNPHOSPHORYLATED
GATP
GADP
P
PHOSPHORYLATED DIMER
ACTIVATED RECEPTOR TYROSINE KINASE


RELAY PROTEIN
CELLULAR RESPONSE
P
TYR
ACTIVATED RTK
INACTIVE RELAY PROTEINS


Insulin
Enzyme-Linked Receptor
S-S
S-S
RTK
[I]
RTK
[A]
P
P
Cell growth
differentiation
Gene expression
Protein
SH2
[I]
Pw
P
[A]
Glut transporter
Glucose
↑ Glucose

Drug Interactions - Pharmacokinetic

A drug interaction is a reaction between two (or more) drugs or between a drug and a food, beverage, or supplement.

- The Drug whose Activity is effected by such an Interaction is called as a "Object drug."
- The agent which precipitates such an interaction is referred to as the "Precipitant".

Types of drug Interactions

1. Drug-drug interactions.
2. Drug-food interactions.
3. Chemical-drug interactions.
4. Drug-laboratory test interactions.
5. Drug-disease interactions

Consequences/Results of Drug Interactions.

(A) **Desirable Effects:**

1. Increased therapeutic Activity:

eg. Sulfamethoxazole & trimethoprim to treat bacterial infection.

2. Reduced Side effect:

eg. furosemide & amiloride to prevent hypokalemia.

(B) **Undesirable Effects:**

1. Loss of therapeutic Activity:

eg. Chlorpromazine blocks antiparkinsonian action of Levodopa.

2. Adverse drug reaction:

eg. Propranolol in digitalized patient can produce bradycardia.

3. Fatal Event:

eg. Concurrent use of Clopidogrel & warfarin can cause hemorrhage.

Mechanism of Drug Interactions:

1. Pharmacokinetic
2. Pharmacodynamic.

Others: 3. Pharmaceutical Incompatibilities (in Vitro)
4. Food drug interactions.

1. Pharmacokinetic Drug Interactions are classified as:

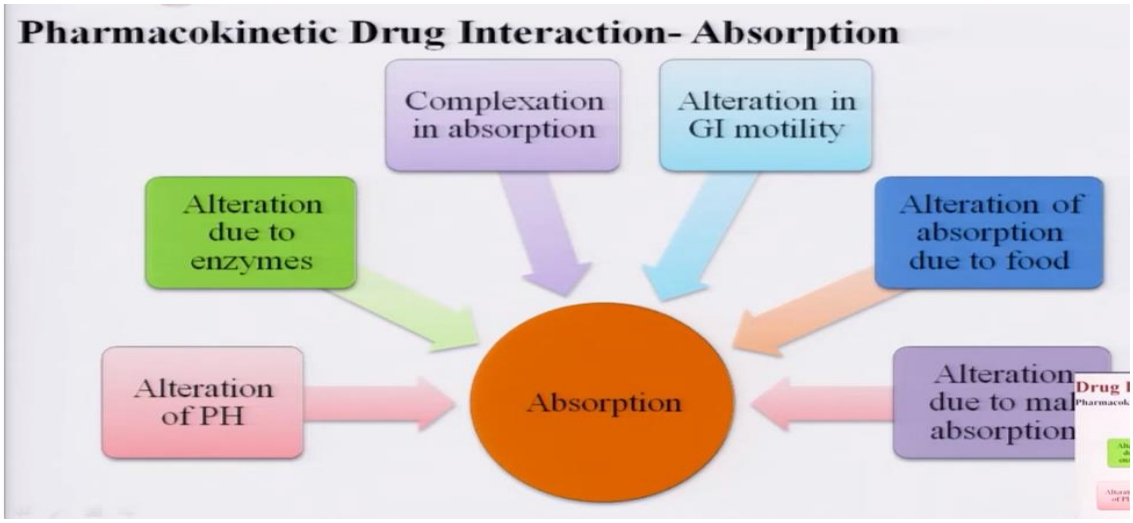
(A) Absorption interactions
(B) Distribution interactions
(C) Metabolism interactions
(D) Excretion interactions.

(A) Absorption interactions:

(a) Tetracycline forms insoluble poorly absorbed complexes with calcium/iron Salts.

(b) Absorption of Ketoconazole is reduced by H_2 blockers & proton pump inhibitors.

(c) Co-administration of Aspirin & prokinetic metoclopramide causes rapid absorption of aspirin.


Pharmacokinetic Drug Interaction- Absorption
Complexation in absorption
Alteration in GI motility
Alteration due to enzymes
Alteration of absorption due to food
Alteration of PH
Absorption
Alteration due to mal absorption