SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai

Approved by Pharmacy Council of India, New Delhi.

Coimbatore -641035

COURSE NAME: BIOPHARMACEUTICS & PHARMACOKINETICS

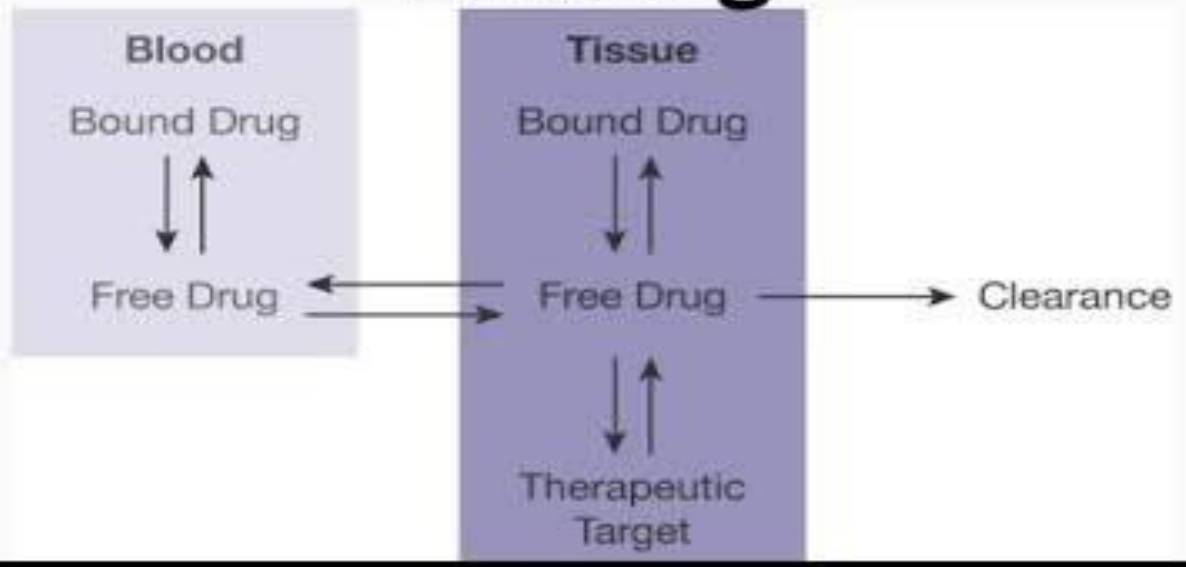
III YEAR / II SEM

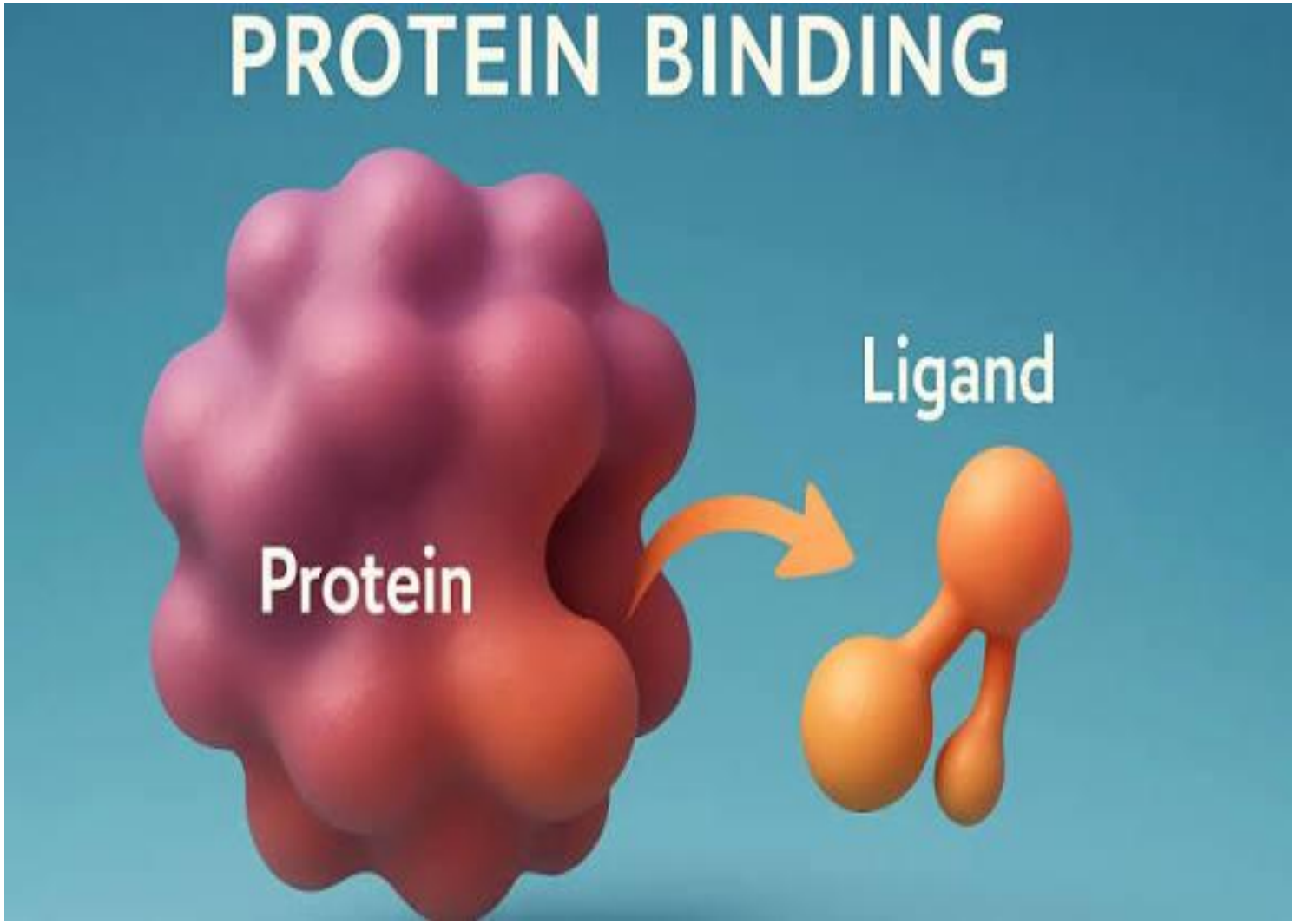
TOPIC 1: ABSORPTION

SUB TOPIC: Clinical significance of protein binding


CLINICAL
SIGNIFICANCE
OF PROTEIN
BINDING
OF DRUGS

Clinical Significance of Protein Binding



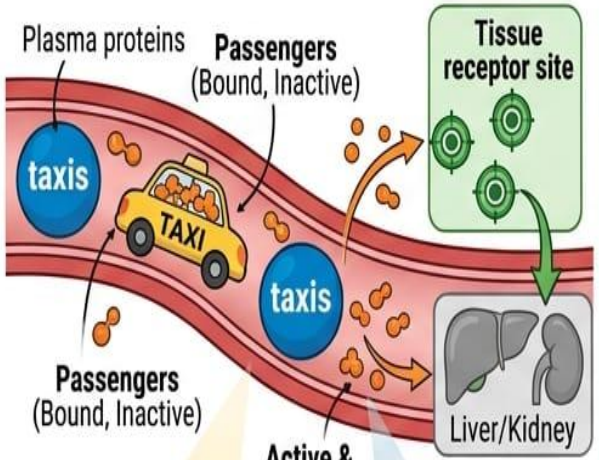

PROTEIN BINDING
Ligand
Protein

SIGNIFICANCE OF PROTEIN BINDING

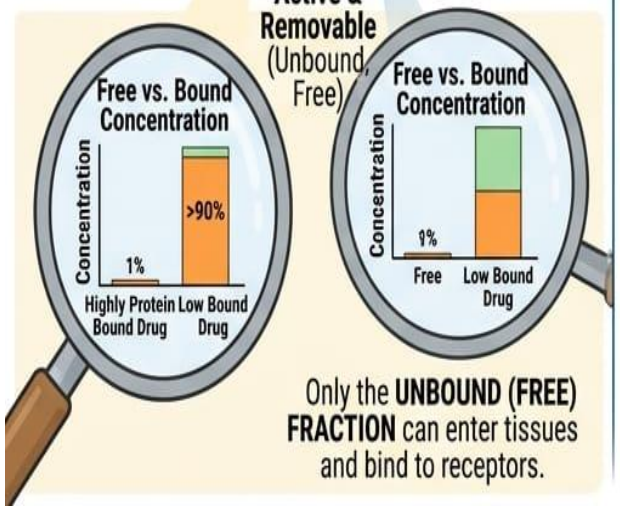
Clinical Significance of Protein Binding of Drugs.

1 The Free Drug Hypothesis

Only the **UNBOUND (FREE) FRACTION** can enter tissues and bind to receptors.



Active & Removable (Unbound, Free)



Only the **UNBOUND (FREE) FRACTION** can enter tissues and bind to receptors.

2 Impact of Altered Binding

(A) Hypoalbuminemia

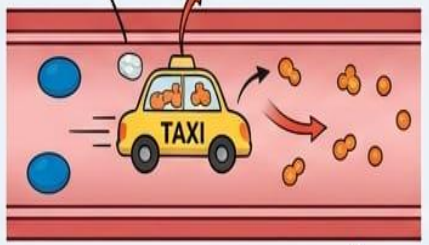
Increased FREE Drugs

TOXICITY RISK
(e.g., Phenytoin in liver disease)

(B) Competition & Displacement

Displacing Drug (e.g., Aspirin)

Drug A (e.g., Warfarin)



Displaced Drug A → Increased FREE Drug A

Bleeding

3 Pharmacokinetics & Elimination

Volume of Distribution (Vd)

HIGH BINDING → **LOW Vd** (Confined to Plasma)

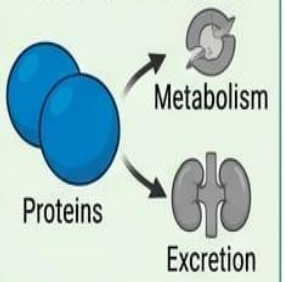
LOW BINDING → **HIGH Vd** (Distributes into Tissues)

taxis

Elimination

Reservoir Effect

Proteins act an slow-release carriers to metabolisms.



Binding slows clearance.

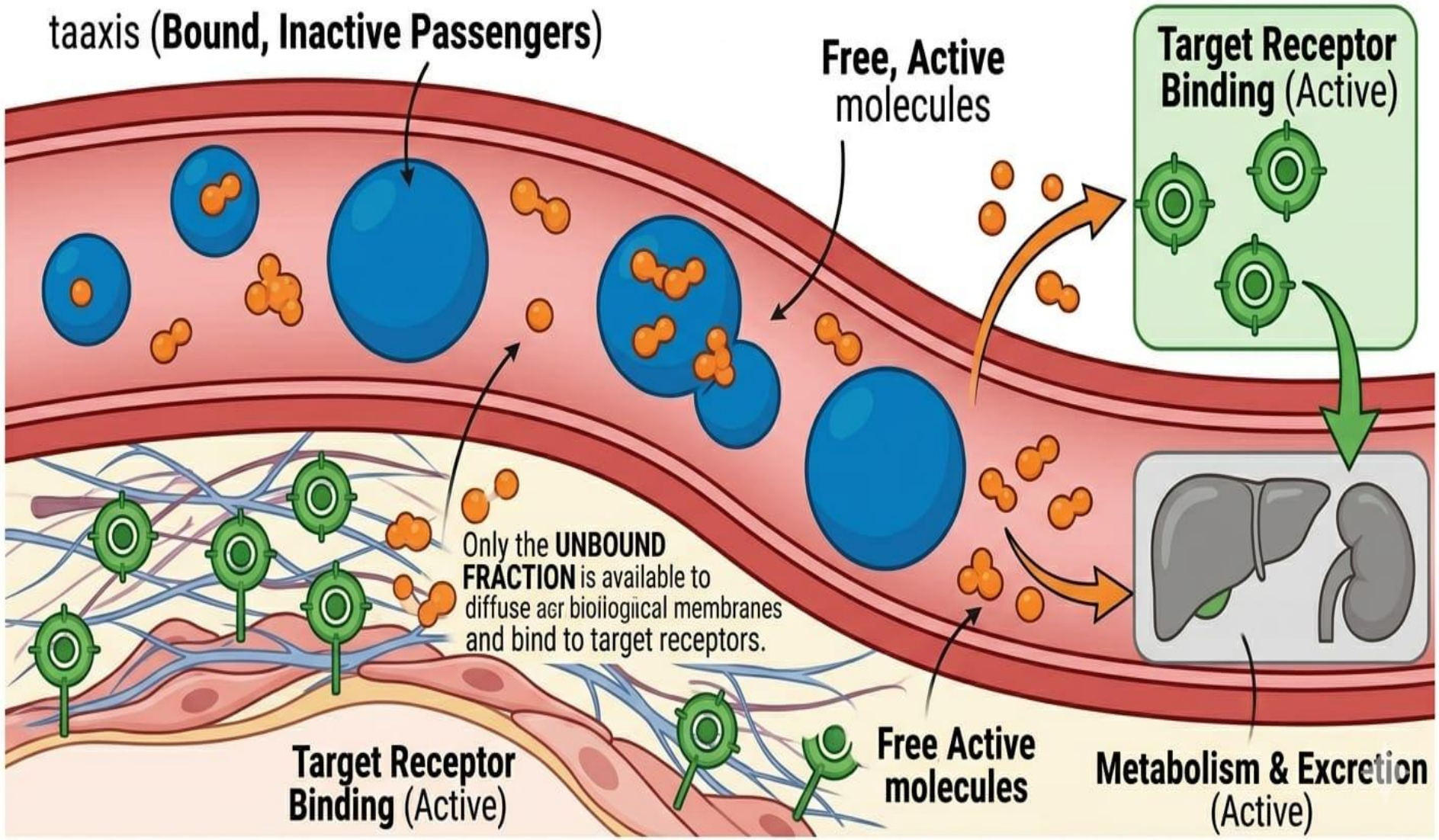
4 Summary Table & Takeaways

Parameter	HIGH BINDING (>90%)	LOW BINDING
Active Fraction	Small	Large
Clinical Danger	Displacement/ Hypoalbuminemia Risk	Low Risk
Elimination Rate	Slower	Faster

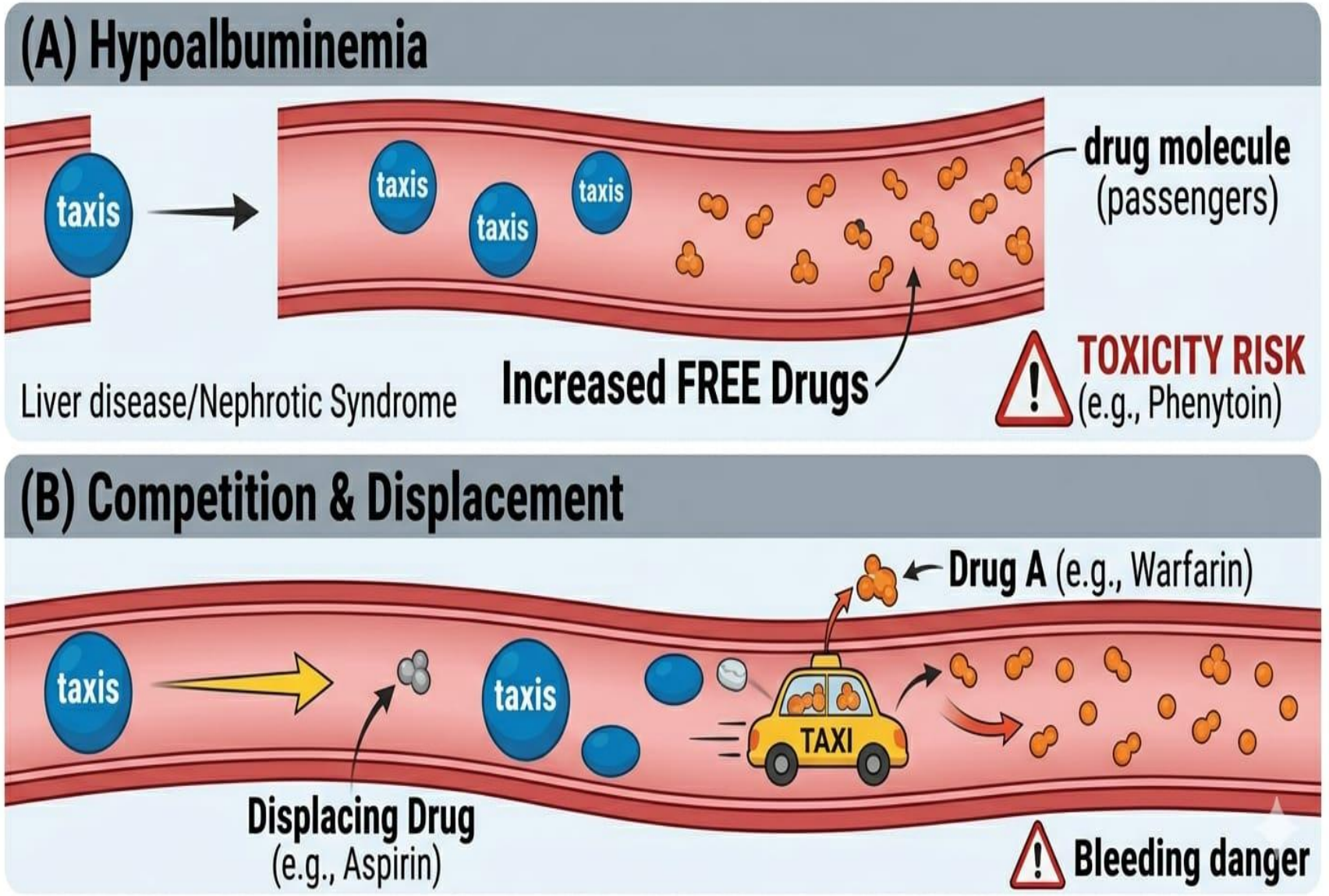
KEY TAKEAWAY

Clinical relevance is mostly limited to HIGHLY BOUND DRUGS (<10% FREE) and PATIENTS WITH LIVER/KIDNEY DYSFUNCTION.

The Free Drug Hypothesis



2 Impact of Altered Binding



Pharmacokinetics and Elimination