

# MECCANISMO D'AZIONE DEI FARMACI

## Azione aspecifica o parzialmente specifica

Proprieta' chimico-fisiche delle molecole:

- Pressione osmotica (mannitolo,  $\text{MgSO}_4$ )
  - Lipofilia (anestetici generali)
- Denaturazione proteica (disinfettanti)
  - Tensioattivi (disinfettanti)

# Azione aspecifica o parzialmente specifica

Proprietà chimiche delle molecole:

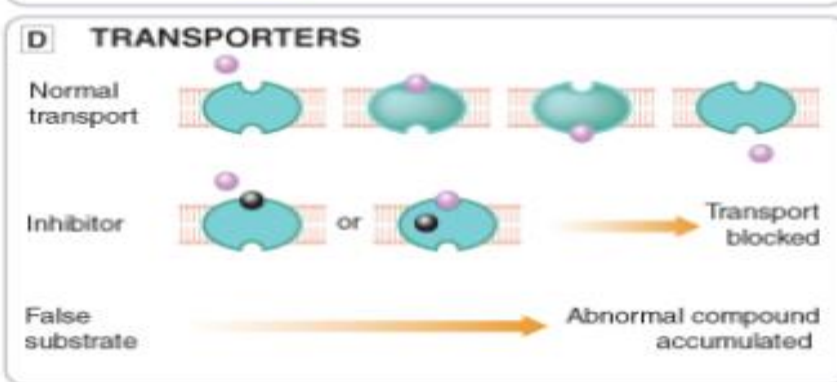
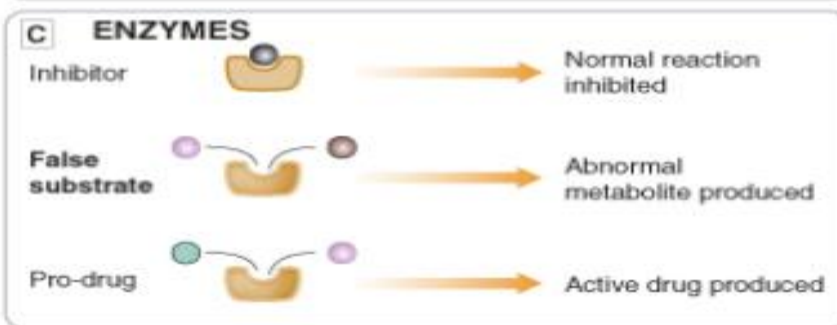
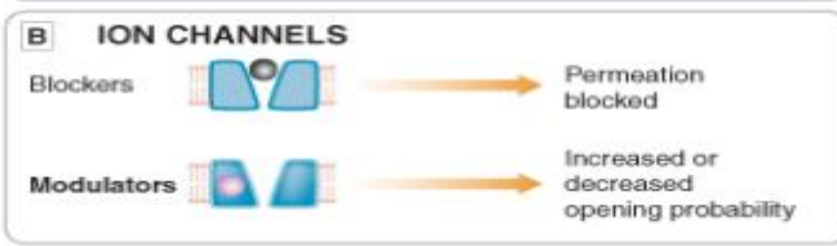
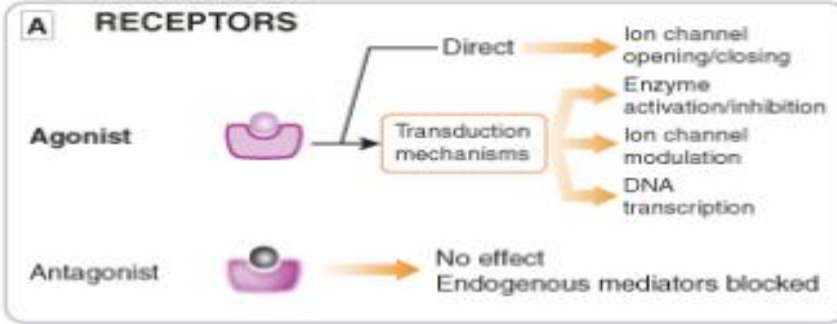
- Ossidoriduzioni (disinfettanti, scavengers)
- Reazioni chimiche (chemioterapici antitumorali)
  - Chelanti (anticoagulanti in vitro)
  - Antidoti

## Azione parzialmente selettiva

Sostanze che prendono parte al metabolismo cellulare (coenzimi, vitamine, ioni, metalli nutrizionali)

## Azione selettiva su:

- Enzimi
- Recettori
- Carriers
- Proteine strutturali (canali ionici)



- Agonist/normal substrate
- Antagonist/inhibitor
- Abnormal product
- Pro-drug

Type of target	Effectors		Chapter(s) to refer to
<b>Receptors</b>	<b>Agonists</b>	<b>Antagonists</b>	
Nicotinic ACh receptor	Acetylcholine	Tubocurarine	10
	Nicotine	$\alpha$ -Bungarotoxin	
$\beta$ -Adrenoceptor	Noradrenaline (norepinephrine)	Propranolol	11
	Isoprenaline		
Histamine (H <sup>1</sup> receptor)	Histamine	Mepyramine	18
Opiate ( $\mu$ receptor)	Morphine	Naloxone	41
Dopamine (D <sup>2</sup> receptor)	Dopamine	Chlorpromazine	35 and 38
	Bromocriptine		
Oestrogen receptor	Ethinylestradiol	Tamoxifen	30
Epidermal growth factor receptor		Trastuzumab	55
<b>Ion channels</b>	<b>Blockers</b>	<b>Modulators</b>	
Voltage-gated sodium channels	Local anaesthetics	Veratridine	44
	Tetrodotoxin		
Renal tubule sodium channels	Amiloride	Aldosterone	24
Voltage-gated calcium channels	Divalent cations (e.g. Cd <sup>2+</sup> )	Dihydropyridines	18 and 19
		Opioids	41
ATP-sensitive potassium channels	ATP	Sulfonylureas	26
GABA-gated chloride channels	Picrotoxin	Benzodiazepines	33

Type of target	Effectors		Chapter(s) to refer to
<b>Enzymes</b>	<b>Inhibitors</b>	<b>False substrates</b>	
Acetylcholinesterase	Neostigmine	-	10
Cyclo-oxygenase	Aspirin	-	14
Angiotensin-converting enzyme	Captopril	-	19
HMG-CoA reductase	Simvastatin	-	20
Monoamine oxidase-A	Iproniazid	-	39
Phosphodiesterase type v	Sildenafil	-	30
Dihydrofolate reductase	Trimethoprim	-	46
	Methotrexate	-	14 and 51
HMG-CoA, 3-hydroxy-3-methylglutaryl-coenzyme A. Thymidine kinase	Aciclovir	-	47

<b>Carriers</b>	<b>Inhibitors</b>	<b>False substrates</b>	
Noradrenaline transporter	Tricyclic antidepressants	-	
	Cocaine		
		Amphetamine	
		Methyldopa	
Weak acid carrier (renal tubule)	Probenecid		
Na <sup>+</sup> /K <sup>+</sup> /2Cl <sup>-</sup> cotransporter (loop of Henle)	Loop diuretics		
Proton pump (gastric mucosa)	Omeprazole		
<b>Others</b>			
Immunophilins	Ciclosporin	-	
	Tacrolimus	-	
Tubulin	Vincristine		
	Taxol	-	

Body\_ID: None

**Acetilcolina**  $\xrightarrow{\text{Acetilcolinaesterasi}}$  **Ac. Acetico + Colina**

Inibitori reversibili: **fisostigmina e derivati, carbammati, edrofonio**

Inibitori irreversibili: **organofosfati**

**L-DOPA**  $\xrightarrow[\text{Carbidopa, Benserazide}]{\text{Dopadecarbossilasi}}$  **Dopamina**  $\xrightarrow[\text{Deprenil,}]{\text{MAO}}$

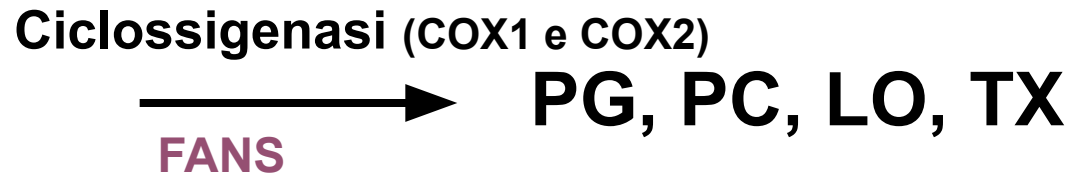
**Angiotensina I**  $\xrightarrow[\text{Captopril, Enalapril, Lisinopril}]{\text{ACE (angiotensin converting enzyme)}}$  **Angiotensina II**

**Bradichinina**  $\xrightarrow[\text{Captopril, Enalapril, Lisinopril}]{\text{Chinasi II}}$  **Eliminazione**



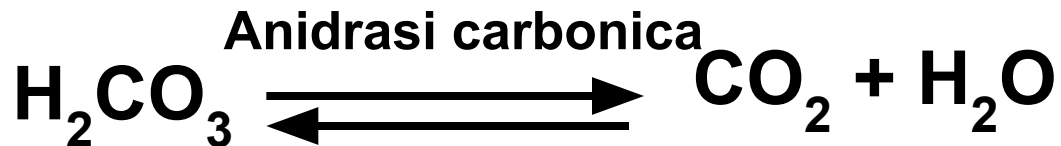


**Cortisonici** □ **Macrocortina**



**Aspecifici: paracetamolo, chetoprofene**

**Specifici: celecoxib, rofecoxib**



**Acetazolamide**

Tetrafolatoreduktasi

**PABA** → **Ac. Folico** → **Ac. Tetraidrofolico**

Sulfamidici

Trimetoprim □ Batteri

Metotrexato □ Uomo

Pirimetamina □ Plasmodi

Transpeptidasi

→ **Parete batterica**

Penicilline, Cefalosporine