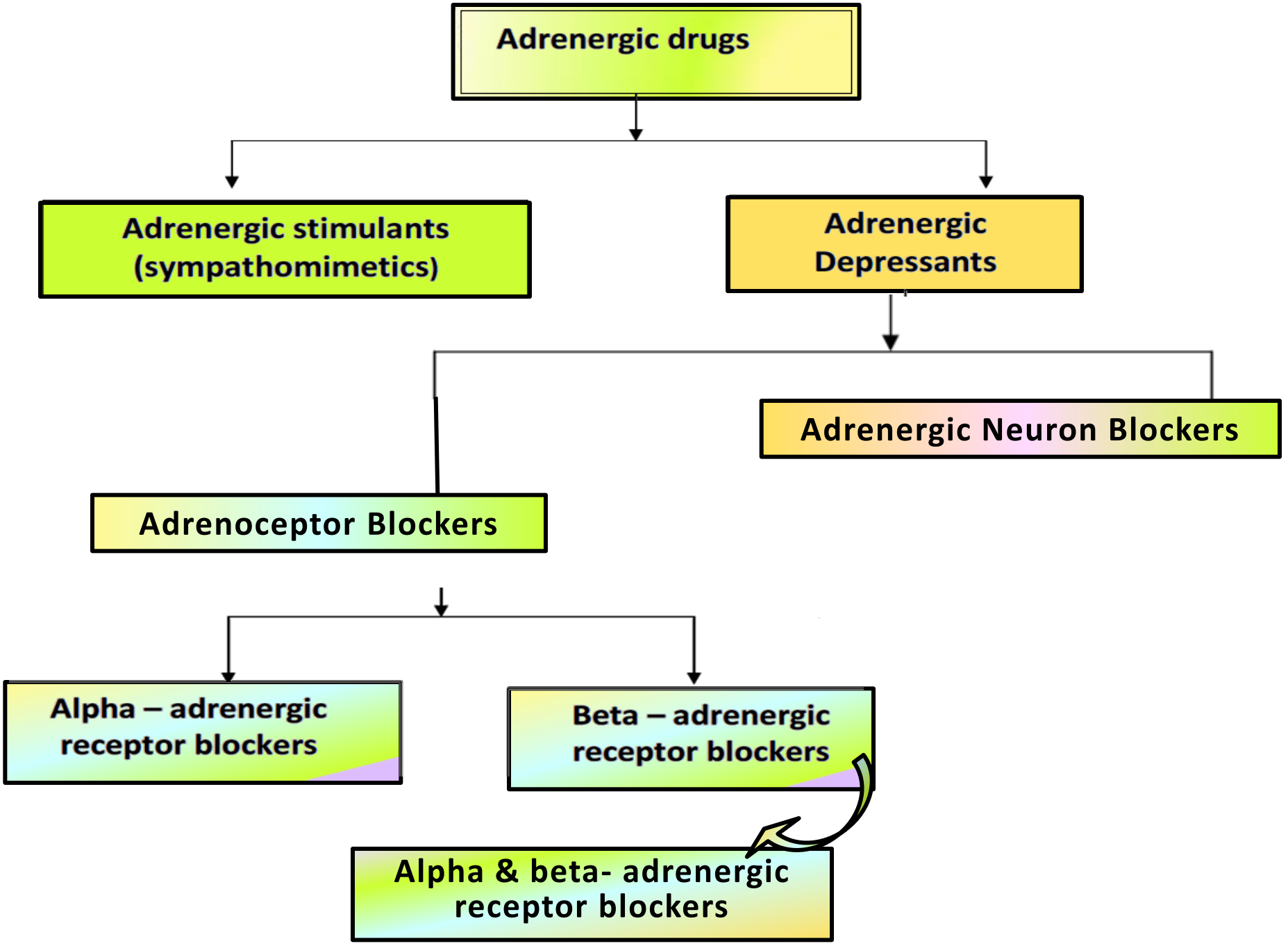
Sympatholytic & adrenergic blockers
α-receptor Antagonists

Prof. Hanan Hagar
Pharmacology Unit
College of Medicine


Adrenergic drugs
Adrenergic stimulants (sympathomimetics)
Adrenergic Depressants
Adrenergic Neuron Blockers
Adrenoceptor Blockers
Alpha – adrenergic receptor blockers
Beta – adrenergic receptor blockers
Alpha & beta- adrenergic receptor blockers

Classification of sympatholytics

➢ *Adrenergic neuron blockers*

- **Formation of False Transmitters**

  e.g. α-Methyl dopa

- **Depletion of Storage sites**

  e.g. reserpine

- **Inhibition of release & enhance uptake**

  e.g. guanethidine

- **Stimulation of presynaptic α_2 receptors**

  e.g. clonidine and α-Methyl dopa

➢ *Adrenergic receptor blockers*

Classification of sympatholytics

α-Methyl dopa

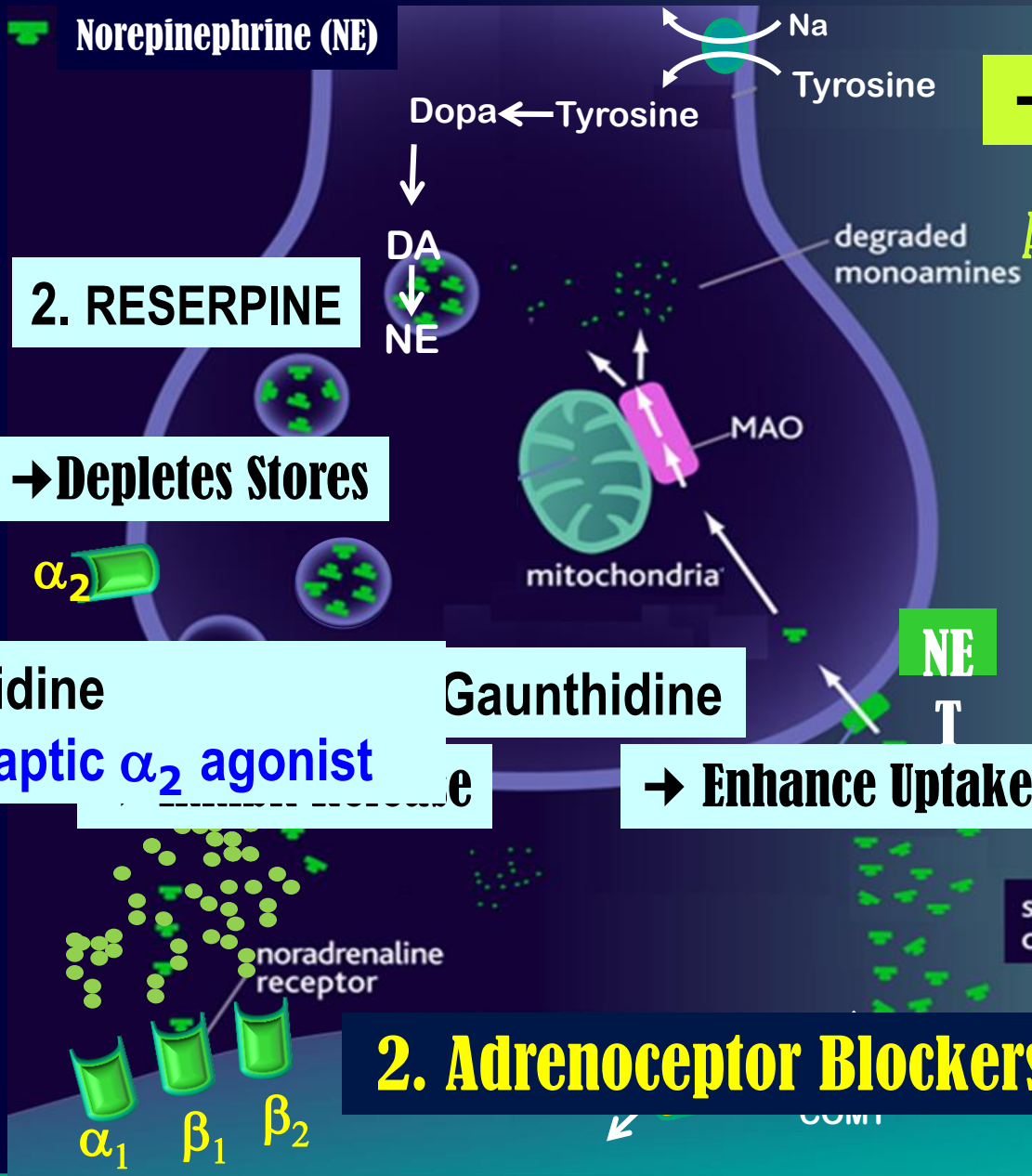
- Forms false transmitter that is released instead of NE
- Acts centrally as α_2 receptor **agonist** to inhibit NE release
- Drug of choice in the **treatment of hypertension in pregnancy (pre-eclampsia - gestational hypertension).**

Clonidine

- Acts directly as α_2 receptor agonist to inhibit NE release
- suppresses sympathetic outflow activity from the brain.
- Little Used as Antihypertensive agent due to **rebound hypertension** upon abrupt withdrawal.
- **Apraclonidine** is used in open angle glaucoma as eye drops.

acts by decreasing aqueous humor formation.

1. Adrenergic Neuron Blockers [SYMPATHOLYTICS]



1. METHYLDOPA

α-methyl tyrosine

→ False Transmitters

→ Antihypertensive in PREGNANCY

2. RESERPINE

→ Depletes Stores

4. Clonidine

Presynaptic α_2 agonist

Gaunthidine

→ Enhance Uptake

2. Adrenoceptor Blockers [ADRENOLYTICS]

Adrenergic receptor blockers

Adrenergic receptor blockers or adrenolytics

They block sympathetic actions by antagonizing

- **α-receptor antagonists or**
- **B-receptor antagonists**

Classification of α-receptor Antagonists

Non-selective antagonists

e.g. phenoxybenzamine & phentolamine.

α_1-selective antagonists

e.g. prazosin, doxazosin.

α_2-selective antagonists

e.g. yohimbine

Non-Selective α- Adrenoceptor Antagonists

Phenoxybenzamine:

Irreversibl block of both α_1 and α_2 receptors

Long-acting (24 hrs).

Phentolamine:

reversible blocking of α1 & α2 receptors.

Short acting (4 hrs).

Both drugs cause:

1) **Postural hypotension.**
2) **Decrease peripheral vascular resistance**
3) **Increase cardiac output (α2 block).**
4) **Reflex tachycardia.**
5) **Both drugs can precipitate arrhythmias and angina and are contra-indicated in : patients with decreased coronary perfusion.**

Reflex tachycardia due to the fall in B.P, mediated by baroreceptor reflex and due to block $\alpha 2$ in heart.

Therapeutic Uses:

- **Pheochromocytoma: Before surgical removal to protect against hypertensive crisis.**

Adverse Effects of non-Selective α- Adrenoceptor Antagonists :

- **Postural hypotension**
- **Tachycardia**
- **Headache**
- **Nasal stuffiness or congestion**
- **Vertigo & drowsiness**
- **Male sexual dysfunction (inhibits ejaculation).**

Selective α_1- Antagonists

Prazosin & doxazosin.

Prazosin (short half-life)

Doxazosin, terazosin (long half life)

α_1–antagonists cause :

- **Vasodilatation due to relaxation of arterial and venous smooth muscles**
- **Fall in arterial pressure with less tachycardia than with non-selective α blockers**

Therapeutic Uses:

- **Benign prostatic hyperplasia.**
- **Treatment of hypertension with prostate enlargement.**
- **Reynaud's disease.**

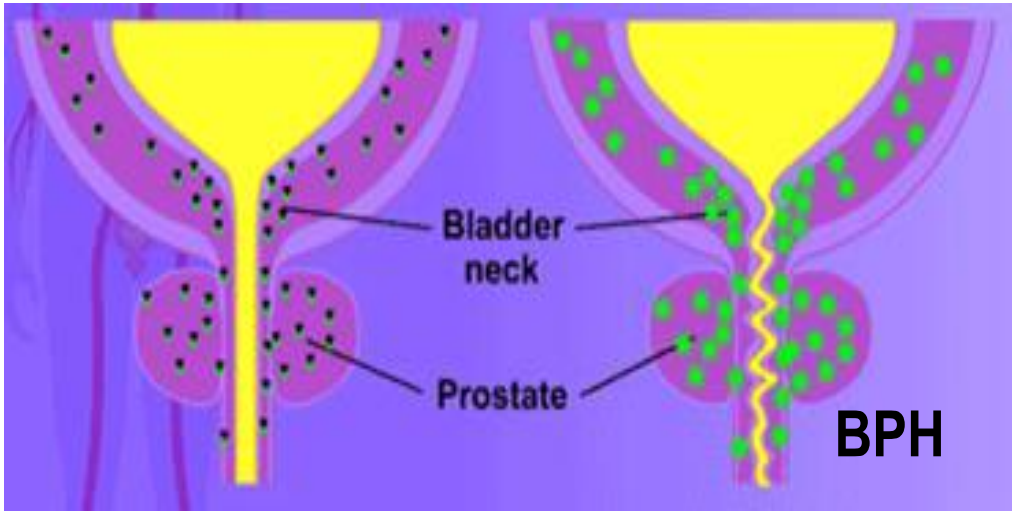
Selective α1A–antagonist
Tamsulosin

- a selective α1A–antagonist.
- α1A receptors present in prostate
- Tamsulosin is used in treatment of benign prostatic hypertrophy (BPH).
- Tamsulosin produce: relaxation of smooth muscles of bladder neck & prostate →improve urine flow.
- Has minimal effect on blood pressure.

Selective α1A–antagonist
Tamsulosin

Tamsulosin

Relaxation of bladder neck can improve urine flow



Adverse effects of α1- Antagonists

as before with non selective but to a lesser degree

α_2-selective antagonists

- **e.g. yohimbine**
- **Used as aphrodisiac in the treatment of erectile dysfunction.**
- **Increase nitric oxide released in the corpus cavernosum thus producing vasodilator action and contributing to the erectile process.**