

UNIT-I DEPTH OF BIOLOGY

1. Pharmacology of drugs acting on cardio vascular system

- a. Introduction to hemodynamic and electrophysiology of heart.
- b. Drugs used in congestive heart failure
- c. Anti-hypertensive drugs. DEPTH OF BIOLOGY
- d. Anti-anginal drugs.
- e. Anti-arrhythmic drugs.
- f. Anti-hyperlipidemic drugs. DEPTH OF BIOLOGY

Anti-hypertensive Agents: Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride,* Clonidine hydrochloride, Guanethidine monosulphate, Guanabenz acetate, Sodium nitroprusside, Diazoxide, Minoxidil, Reserpine, Hydralazine hydrochloride.

③ AntiHypertensive $\Rightarrow$ (Hypertension Lecture)
↓
Check Description.

Antihypertensives are a class of drugs that are used to treat hypertension (high blood pressure). Antihypertensive therapy seeks to prevent the complications of high blood pressure, such as stroke, heart failure, kidney failure and myocardial infarction.

(Hypertension? , Cause?
Risk factor,

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Hypertension $\Rightarrow$ Elevation of Systolic & Diastolic Blood Pressure

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Normal Blood pressure $\rightarrow \frac{120}{80}$ mmHg.

Inhibit reabsorb.



Classification (Antihypertensive)

① Diuretics

$\rightarrow$ Thiazide $\rightarrow$ Hydrochlorothiazide, Chlorthalidone.
 $\rightarrow$ Loop Diuretics = furosemide.

$\rightarrow$ Aldosterone Antagonist $\rightarrow$ Spironolactone

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Diuretics: DEPTH OF BIOLOGY

Carbonic anhydrase inhibitors: Acetazolamide*, Methazolamide, Dichlorphenamide.

Thiazides: Chlorthiazide*, Hydrochlorothiazide, Hydroflumethiazide, Cyclothiazide,

Loop diuretics: Furosemide*, Bumetanide, Ethacrynic acid.

Potassium sparing Diuretics: Spironolactone, Triamterene, Amiloride.

Osmotic Diuretics: Mannitol

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Anti-hypertensive Agents: Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride,* Clonidine hydrochloride, Guanethidine monosulphate, Guanabenz acetate, Sodium nitroprusside, Diazoxide, Minoxidil, Reserpine, Hydralazine hydrochloride.

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② Renin Angiotensin System Inhibitor $\Rightarrow$

(i) ACE Inhibitor $\rightarrow$ Captopril, Lisinopril.

(ii) Angiotensin Receptor (AT₁) Blocker $\Rightarrow$ Telmisartan.

(iii) Direct Renin Inhibitor $\rightarrow$ Aliskiren. DEPTH OF BIOLOGY

③ Sympathetic Inhibitor $\Rightarrow$

(a) β -blocker $\Rightarrow$ Propranolol, Metoprolol, Atenolol

(b) α -blocker $\Rightarrow$ Prazosin, Terazosin.

(c) $\alpha + \beta$ blocker $\rightarrow$ Labetalol. DEPTH OF BIOLOGY

(d) Central Sympatholytic $\Rightarrow$ Methyldopa.

④ Ca-Channel blocker $\Rightarrow$ Verapamil, Amlodipin

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Nifedipin

⑤ Vasodilator $\Rightarrow$ Nitroprusside Sodium, Hydralazine

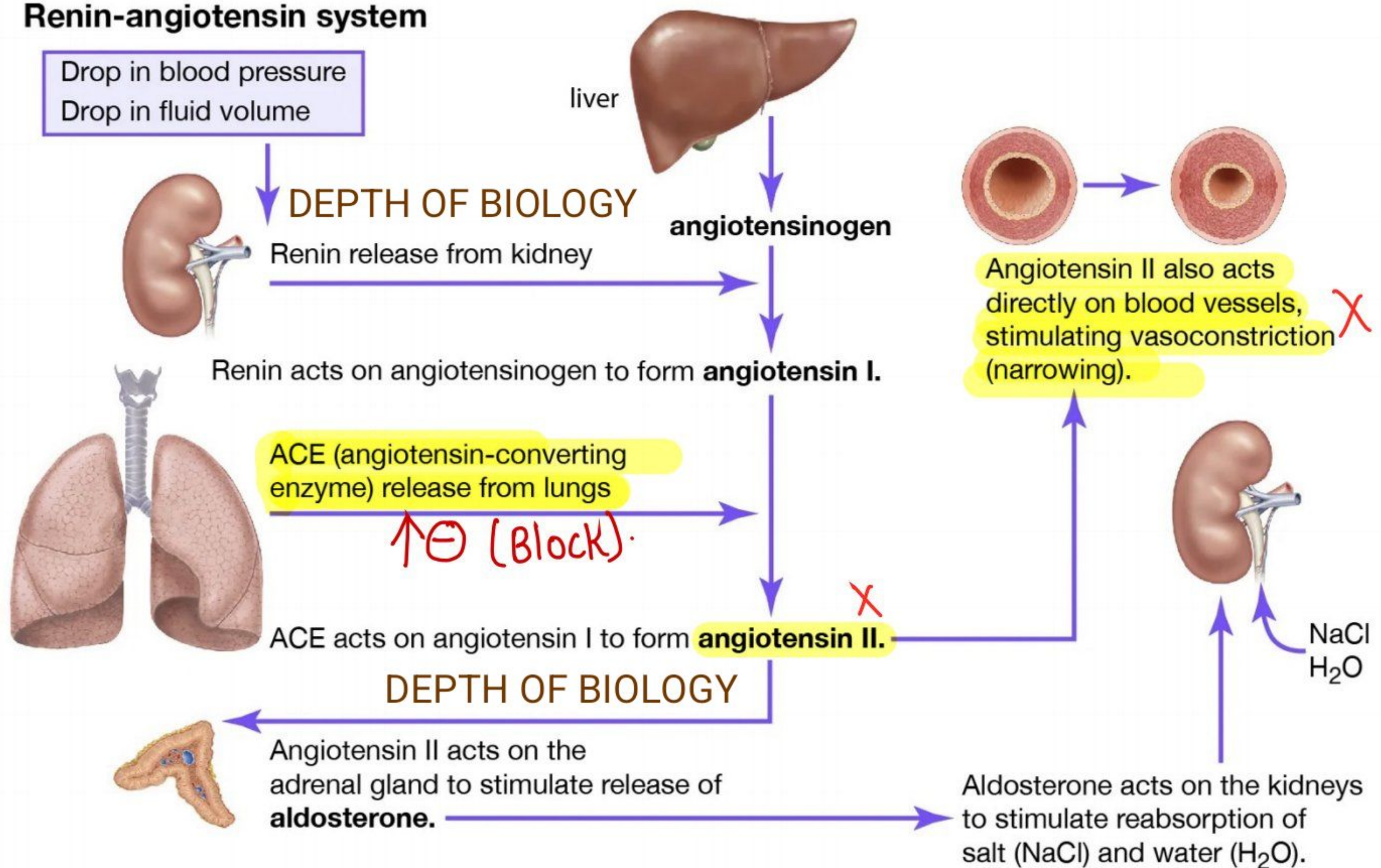
Mechanism of Action

a) Diuretics $\Rightarrow$ Check Lecture

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b) Renin-Angiotensin System Inhibitor $\Rightarrow$

Renin-angiotensin system



③ Sympathetic Inhibitor $\Rightarrow$ DEPTH OF BIOLOGY

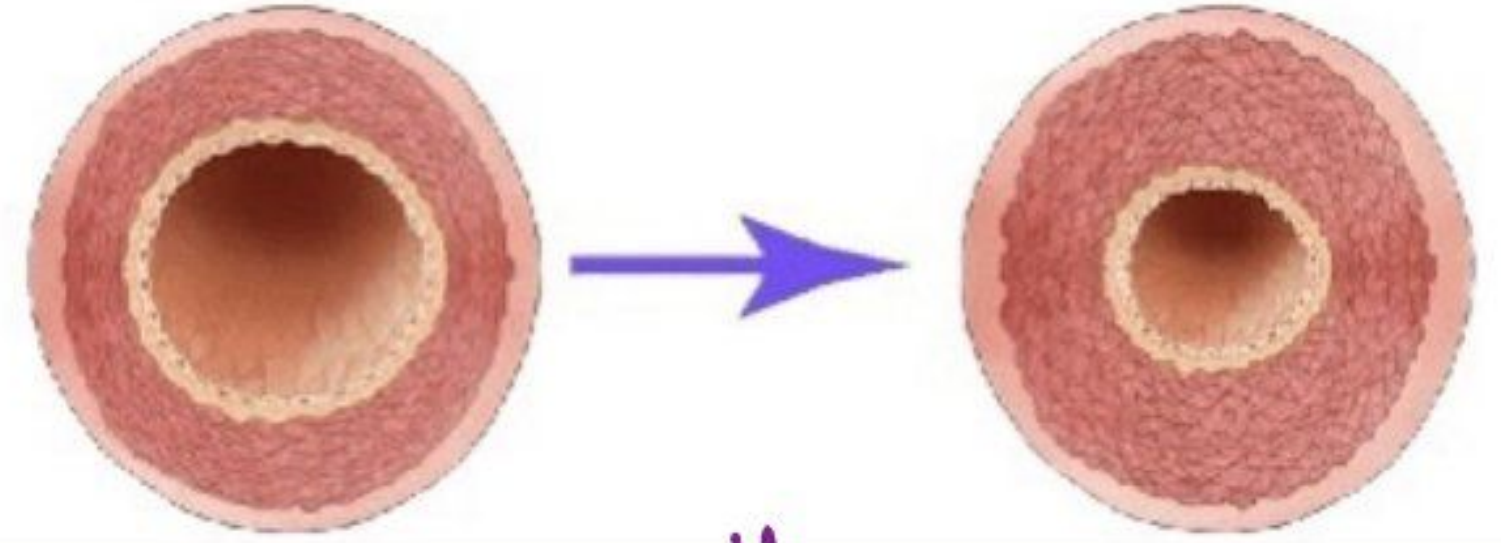
• FFF

Lead to Vasoconstriction.

① β -blocker

β_1 receptor
found in Heart

β_2 receptor
found in Lungs.



Lead to Hypertension.

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β_2 -blocker = Metoprolol.

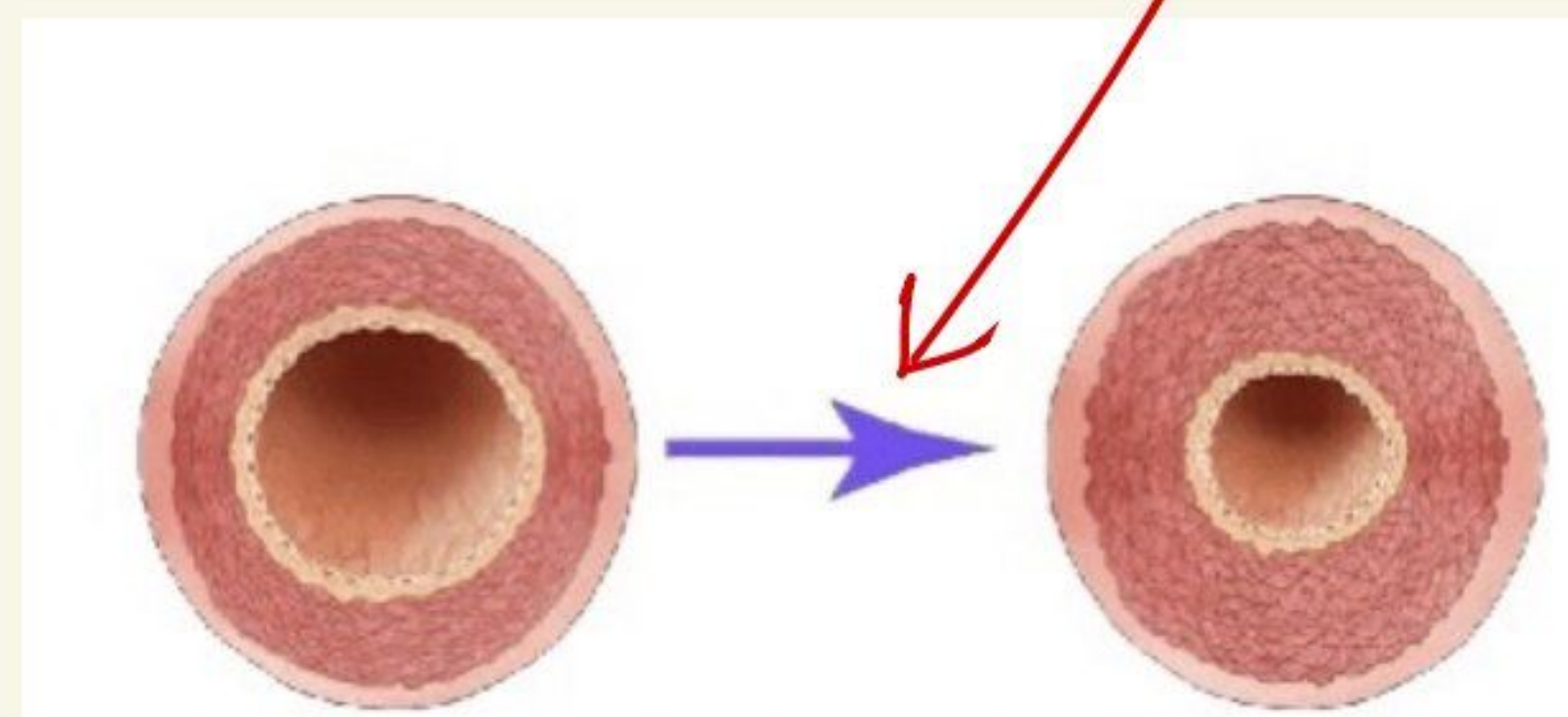
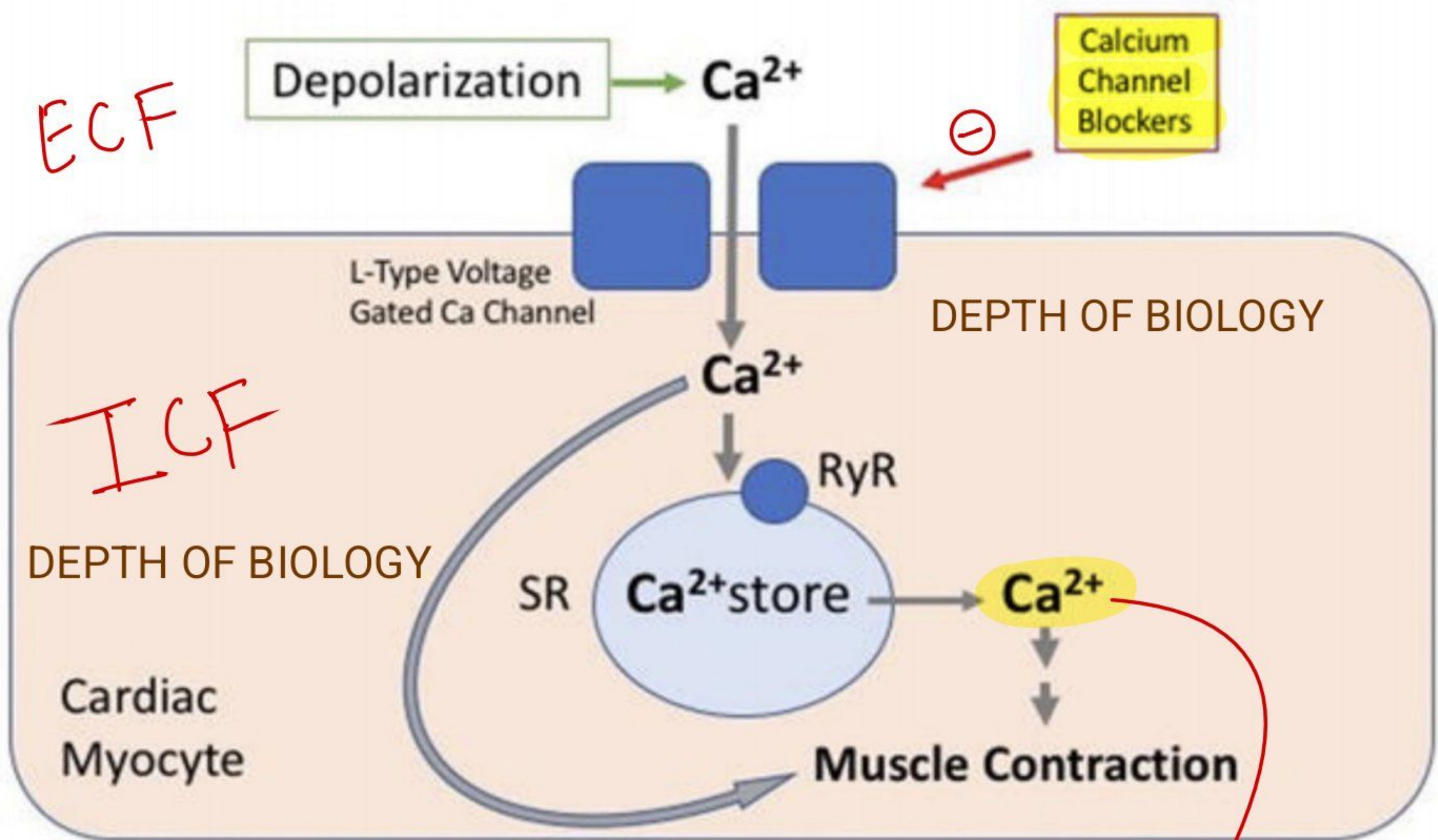
Cardiac Output $\downarrow$

Renin $\downarrow$

Decrease Sympathetic Outflow from C.N.S
 $\downarrow$
decrease the formation of Angiotensin II $\rightarrow$ Aldosterone $\downarrow$

④ Ca²⁺ Channel Blocker ⇒

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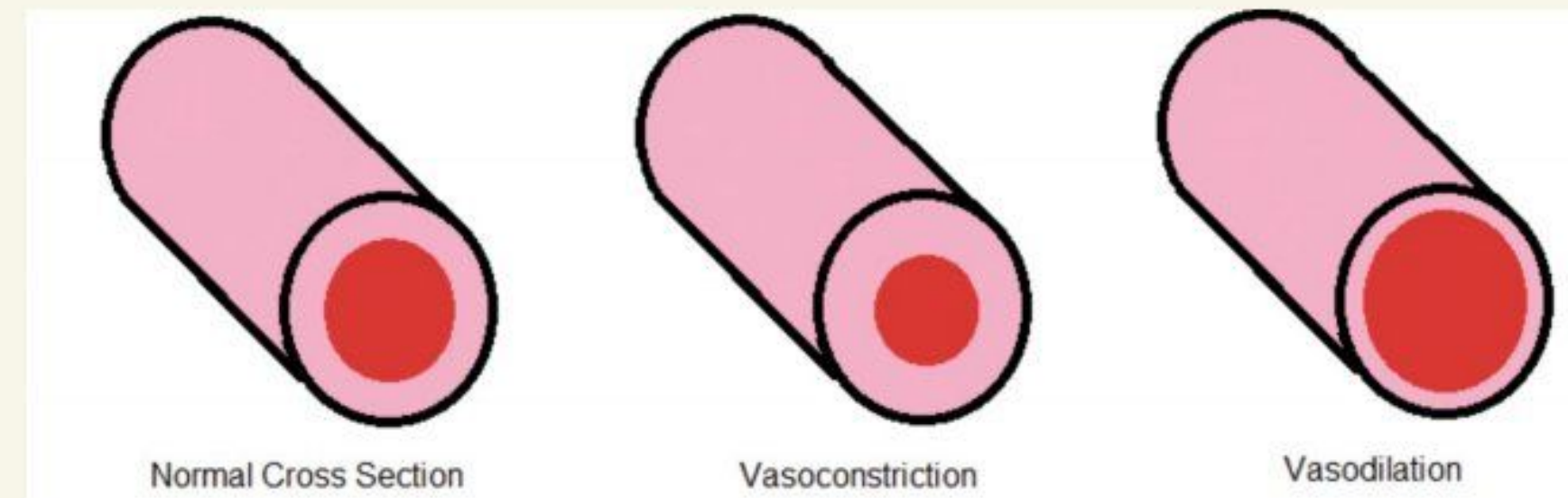


⑤ Vasodilation ⇒

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Caused by
Vasodilator

Vasodilators are medications that open (dilate) blood vessels. They affect the muscles in the walls of the arteries and veins, preventing the muscles from tightening and the walls from narrowing. As a result, blood flows more easily through the vessels.



Sodium nitroprusside

Break down into Circulation
to release

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Nitric oxide

Activates

Guanylyl cyclase

GTP

cGMP ↑↑

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Vasodilation

↓ BP

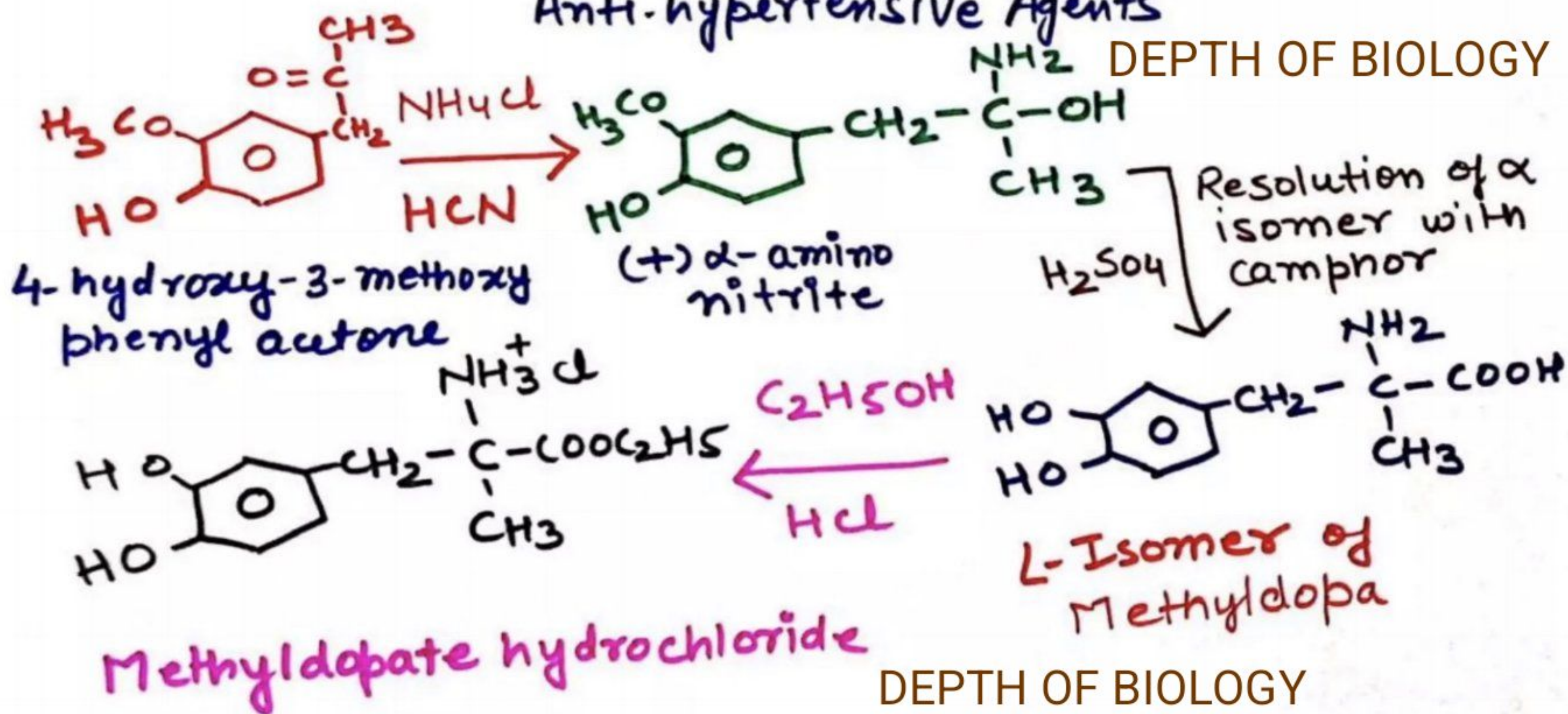
Sodium nitroprusside breaks down in circulation to release nitric oxide

(NO). It does this by binding to oxyhaemoglobin to release cyanide, methaemoglobin and nitric oxide. NO activates guanylate cyclase in vascular smooth muscle and increases intracellular production of cGMP.

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Methyldopate hydrochloride Anti-hypertensive Agents

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