

# ANTI-HYPERLIPIDEMIC AGENTS

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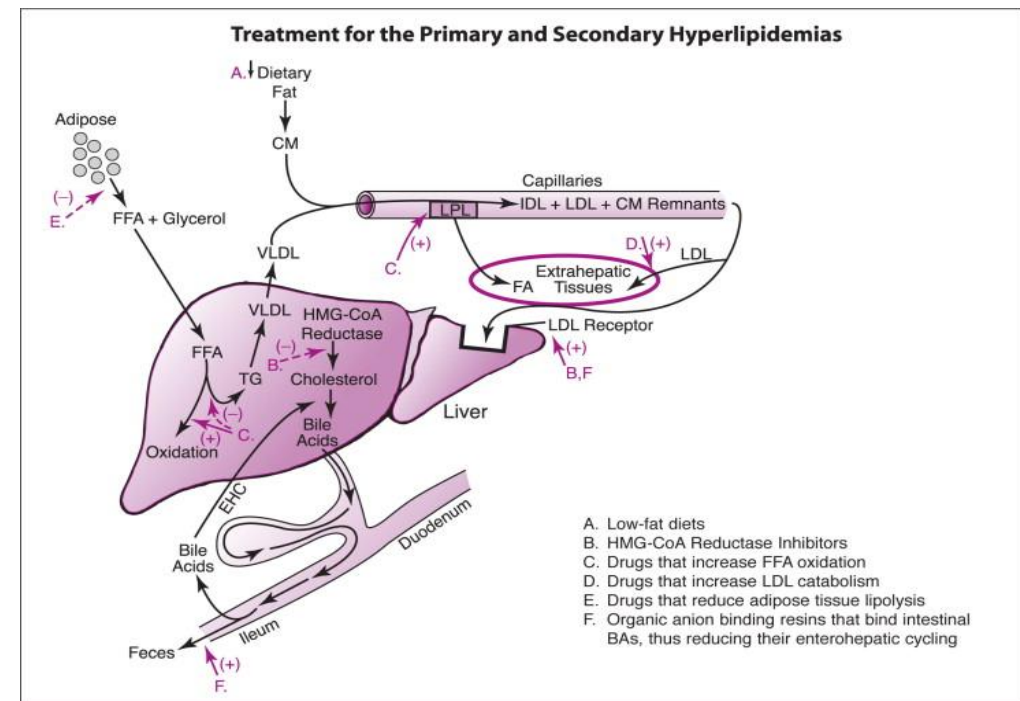
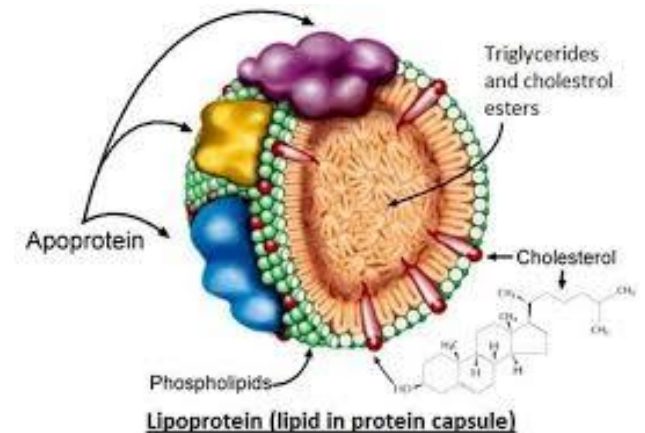
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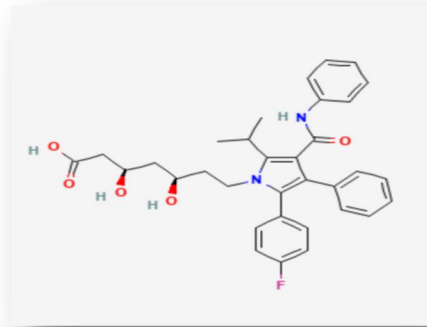
### 1. Definition:

Anti hyperlipidemic agents promotes reduction of lipid levels in the blood .some anti hyperlipidemic agents aim to lower the levels of low-density lipoprotein (LDL) cholesterol, some reduce triglyceride levels, and some help raise the high – density lipoprotein (HDL) cholesterol.

### 2. Classification:

- HMG Co-A Reductase Inhibitor: Lovastatin, Simvastatin, Atorvastatin
- Fibric Acid Derivatives: Clofibrate, Fenofibrate
- Cholesterol Absorption Inhibitors: Ezetimibe.
- Misc .class- Ezetimibe, Clofibrate.





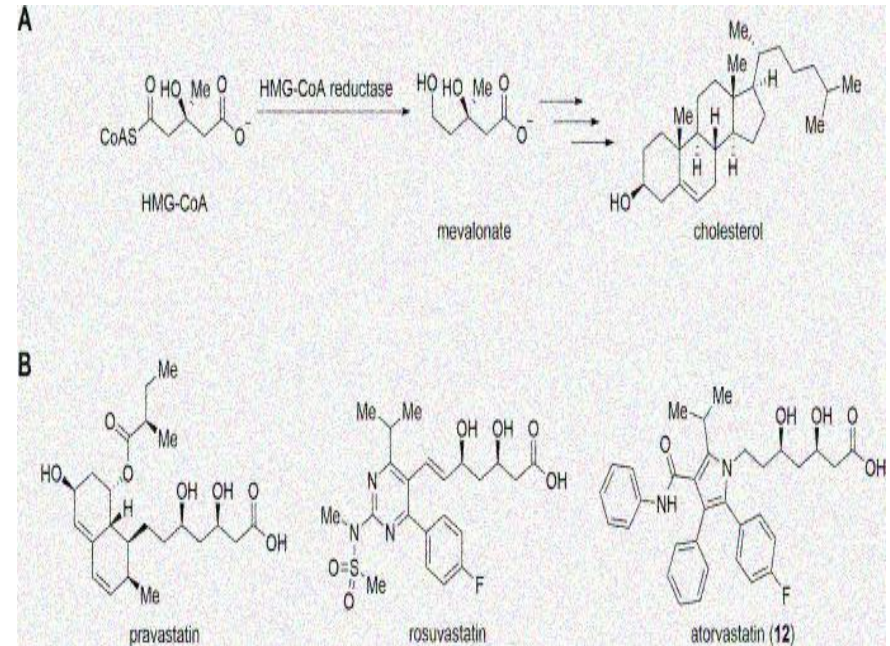
## ATORVASTATIN

Atorvastatin is an HMG-CoA reductase inhibitor used to lower lipid levels and reduce the risk of cardiovascular disease including myocardial infarction and stroke.

**Molecular Formula :**  $C_{33}H_{35}FN_2O_5$

### SIDE EFFECTS :

- Joint pain
- Stuffy nose
- Diarrhea
- Pain in your arms or legs

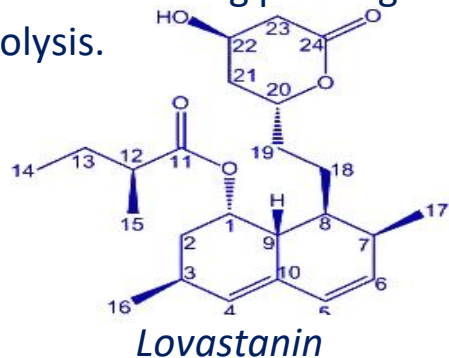


## SYNTHESIS OF ATORVASTATIN

Role of HMG-CoA reductase in the synthesis of cholesterol (a) and structure of some of the most clinically used statins (b)

### ➤ SAR of HMG Co-a Reductase Inhibitor:

1. 3,5 dihydro carboxylate is essential.
2. Lactone containing prodrug require in vivo hydrolysis.



3. Altering distance between C5 and ring diminishes the activity
4. A double between C6 and C7 can either increase or decrease activity.
5. Ethyl group provide optimal activity for drugs contain some heterocyclic ring (pyrrole ring in atorvastin).



### ➤ Mechanism of action

Stimulation of Peroxisome Proliferator Activated receptors [PPARs]



Activate fatty acid oxidation and inhibition of triglyceride synthesis



Reduce expression of apo C III and enhance action of lipoprotein lipase enzyme



Significantly reduce VLDL

**Reference:** Textbook of medicinal chemistry by Nirali prakashan Dr. SSKadam K R mahadip pg no 71-79

## COAGULANTS AND ANTICOAGULANTS

**COAGULANTS** : Coagulants are a substance which cause particles in a liquid to curdle and clot together .

### CLASSIFICATION OF COAGULANTS :

#### COAGULANT

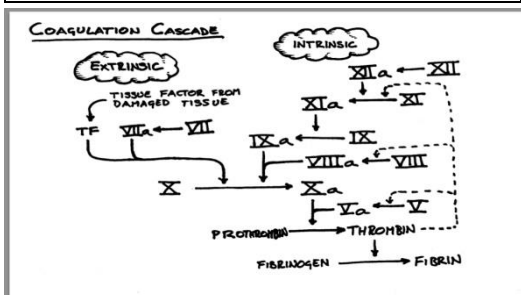
#### VITAMIN K

K1 from plant, fat soluble  
 eg: phytonadine, phylloquinone  
 k2 (produced by bacteria)  
 fat soluble : eg: menadione  
 h<sub>2</sub>o soluble: eg: menadione sod.  
 Bisulphate

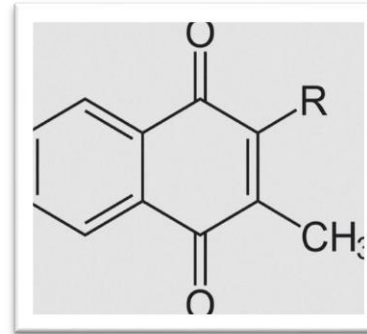
#### MISCELLANEOUS

eg: fibrinogen, rutin, ethansylate,

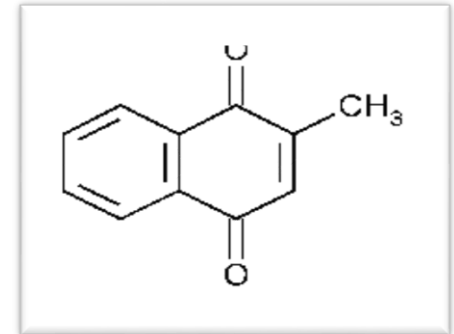
### MECHANISM OF ACTION :



### VIT.K STRUCTURE



### MENADIONE



**ANTICOAGULANTS** : These are the drugs which reduced the coaguability of blood is called anticoagulant.

### CLASSIFICATION OF COAGULANTS :

#### 1) USED IN VITRO

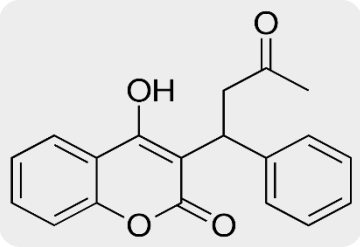
- Heparin
- calcium complexing agents. eg: sodium citrate

#### 2)used in vivo

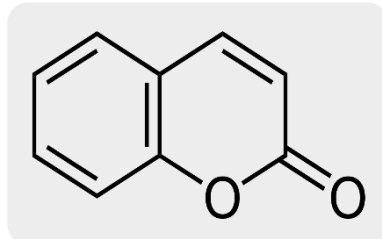
- parental -heparin
- oral - coumarin derivatives. eg: warfarin, bishydroxy coumarin
- indanidone derivatives eg: phenindione

## STRUCTURE

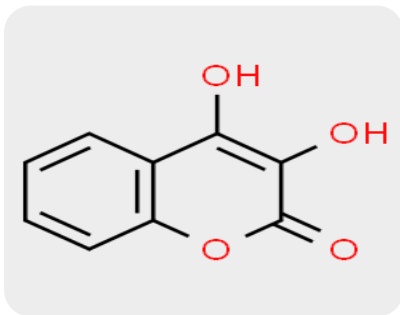
WARFARIN



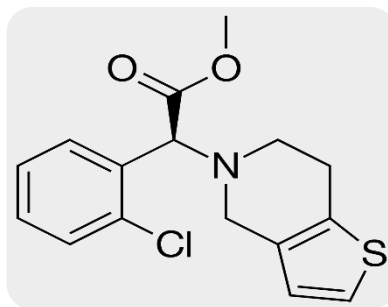
COUMARIN



BISHYDROXYCOUMARIN



CLOPIDOGREL



## SAR OF ANTICOAGULANTS :

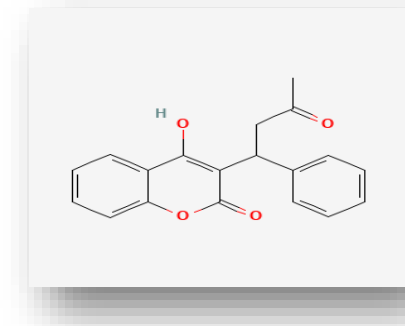
Warfarin is the weakly acidic

in nature due to 4-hydroxy substitution in the structure.

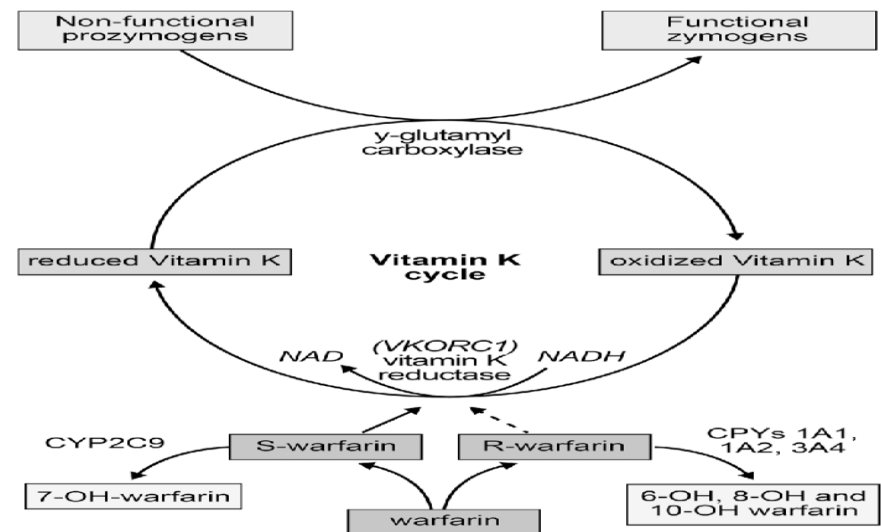
- The substitutes at c3 and c4 position essential for activity.

- The warfarin has chiral centre which shows stereoselective activity.

- The s- enantiomer is 4 times active than r-form .

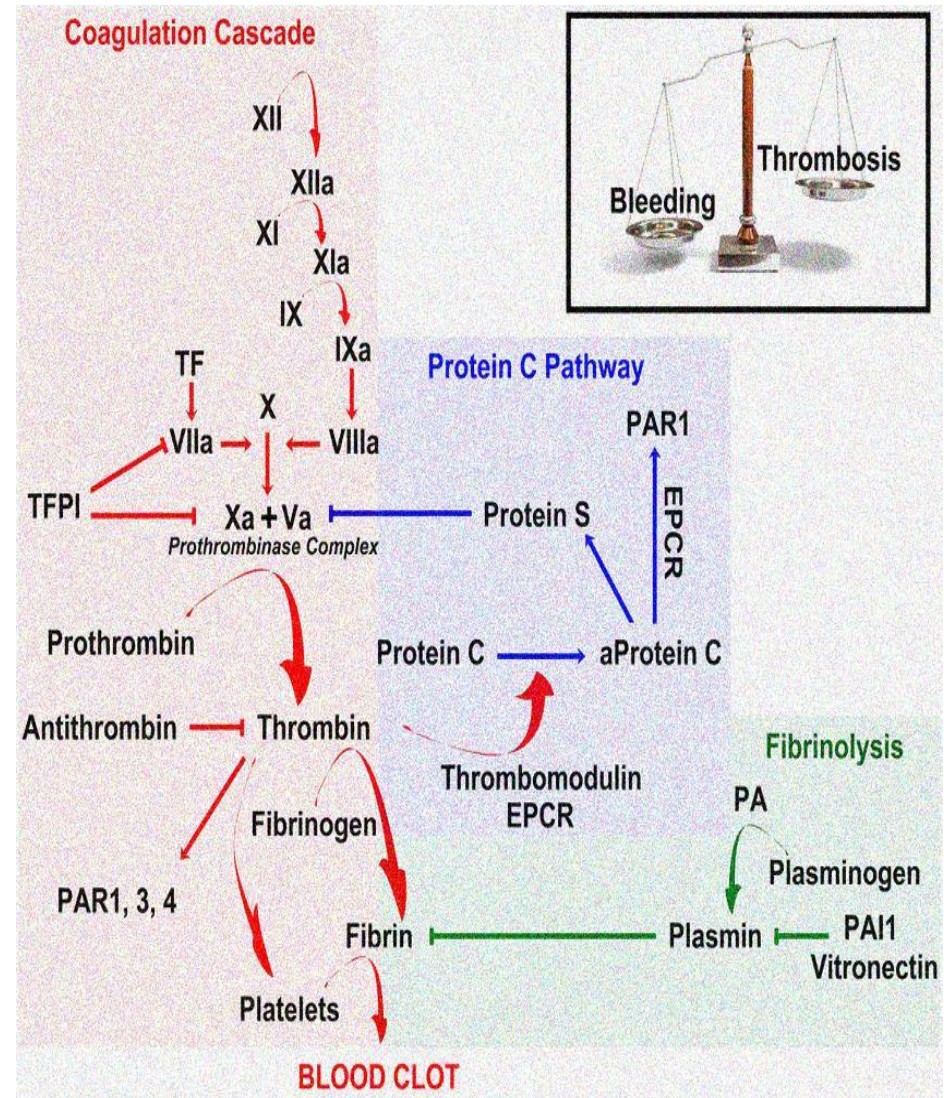


## MECHANISM OF ACTION :



## CLOTTING FACTOR MNEMONICS :

- 1) Foolish – Fibrinogen
- 2) People- Prothrombin
- 3) Try-Thromboplastin
- 4) Climbing - Calcium
- 5) Long- Labile factor
- 6) Nil
- 7) Slopes- Stable factor
- 8) After –Anti-haemophilic factor - A
- 9) Christmas-Christmas factor
- 10) Some-Stuart-prowen factor
- 11) People - Plasma thromboplastin antecedent
- 12) Have – Hageman factor
- 13) Fallen – Fibrin stabilizing factor



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1) Definition

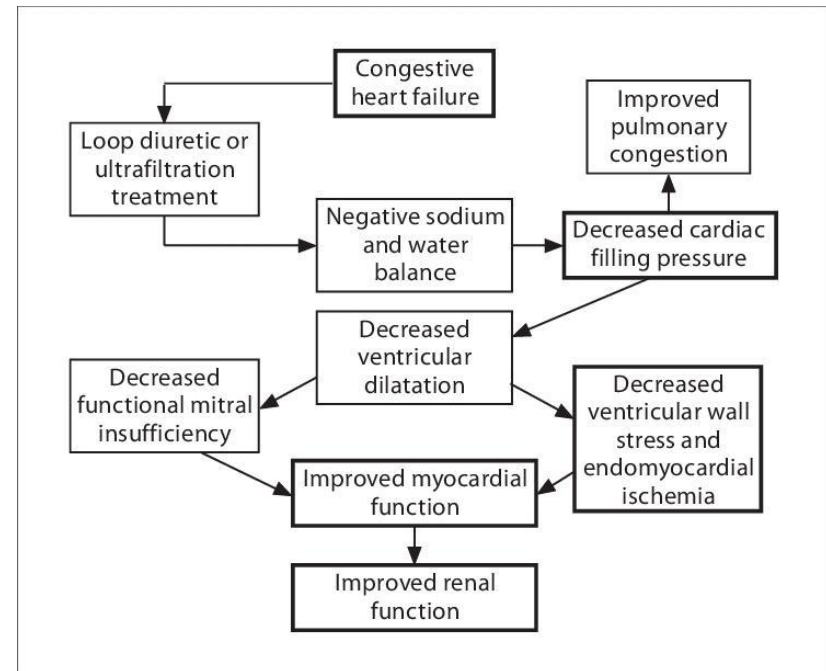
2) Drugs used In CHF

3) Mechanism of Action

4) Therapeutic uses

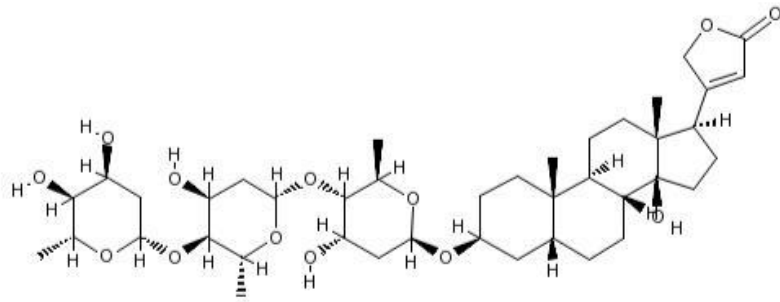
- **CONGETIVE HEART FAILURE**

- A chronic condition in which the heart doesn't pump blood as well as it should

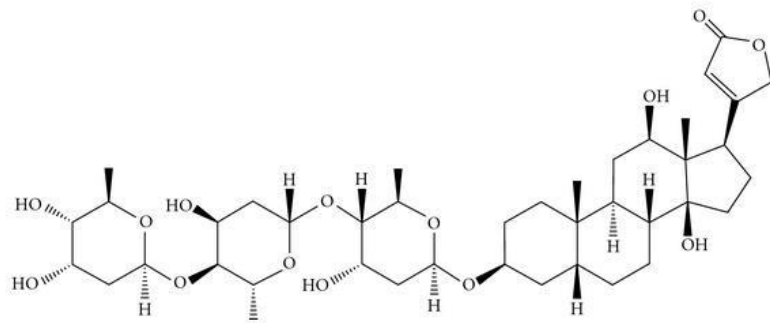


- **DRUGS USED IN CHF**

1) Digoxin



## 2) DIGITOXIN



### • MECHANISM OF ACTION

The pulmonary and peripheral edema seen in CHF are the result of multiple physiologic disturbances. **Decreased cardiac output leads to relative renal hypoperfusion** that stimulates neurohormonal activation of the renin-angiotensin-aldosterone axis.

### • THERAPEUTIC USE'S

1) For treatment of mild to moderate heart failure in adults patients

2) To increase myocardial contraction in children diagnosed with heart failure.



### **REFERENCE :**

- Wilson & Gisvolds Textbook of Organic Medicinal Chemistry
- Textbook of medicinal chemistry by Nirali prakashan Dr. SSKadam K R mahadip pg no 71-79
- wilson and givold's textbook of organic chemistry and p'chemistry twelfth edition , page no 654 to 662
- Textbook of William. o. foye principle of medicinal chemistry , third edition , page no. 383 to 393
- Dr.S.S kadam ,.K.R.Mahadik Textbook of medicinal
- Chemistry by nirali prakshan Page No.15.7-15.70

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