

Steroid

Presented by

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M.Sc. -II/Sem-III (Natural Product)

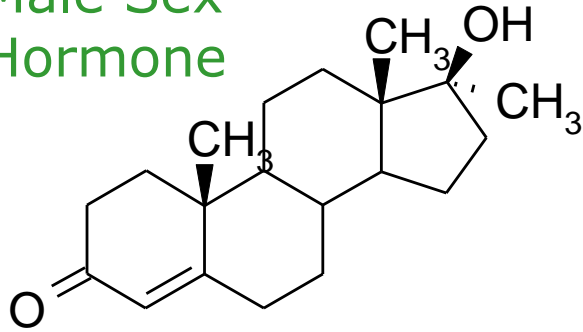
Steroids

Overall Organization of the Lecture Series

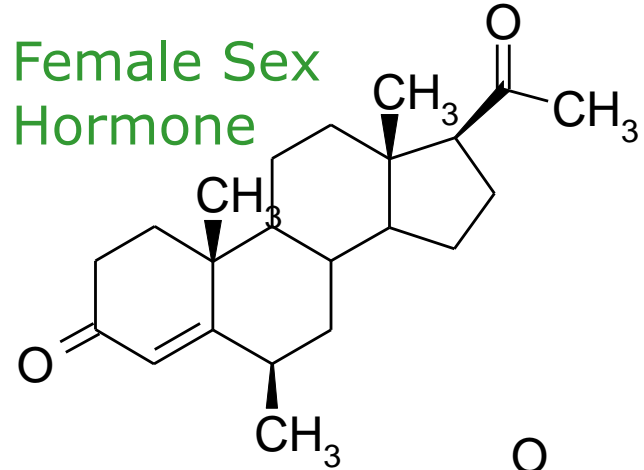
- √ **Structure, Nomenclature, Conformation, Configuration**
- √ **Anti-Hyperlipidemic Agents**
- √ **Androgens**
- √ **Estrogens and Progestins**
- √ **Anti-inflammatory Steroids and Salt Retaining Agents**

Examples of Steroid-based Drugs in Use Today

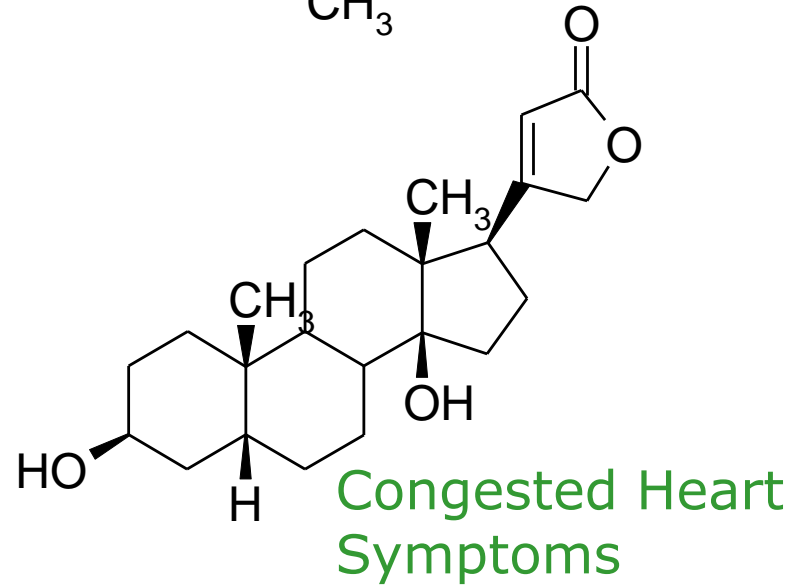
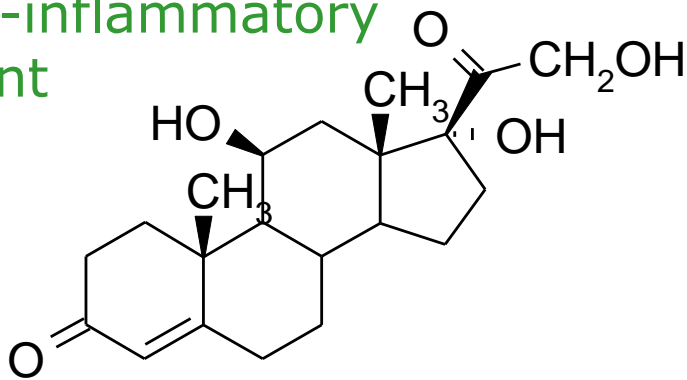
Male Sex
Hormone



Female Sex
Hormone



Anti-inflammatory
Agent



Functional Classification of Steroids

√ **Anabolic Steroids**

- Interact with androgen receptor; enhance muscle mass/athlete's performance; male sex hormones

√ **Glucocorticoids**

- regulate metabolism and immune function; anti-inflammatory activity

√ **Mineralocorticoids**

- maintain blood volume and renal excretion

√ **Progestins**

- Development of female sex organs and characteristics

√ **Phytosteroids**

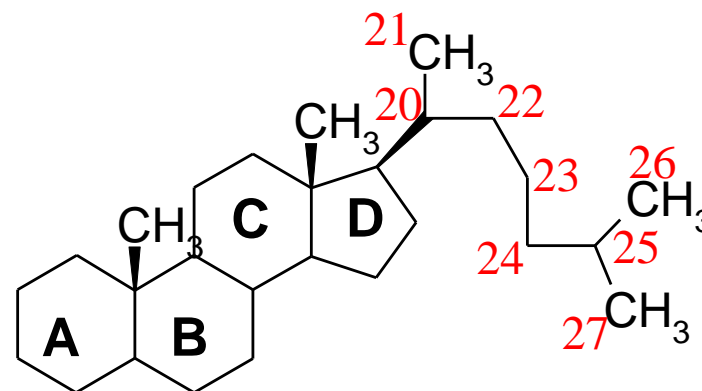
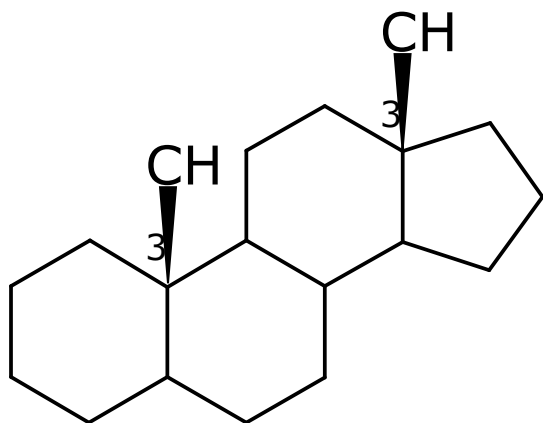
- Plant steroids

√ **Ergosteroids**

- Steroids of the fungi; vitamin D related

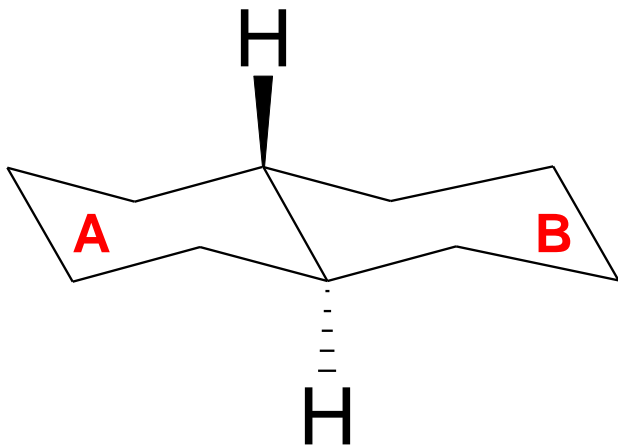
Structures of Steroids

Structure and Nomenclature of the Steroid Nucleus

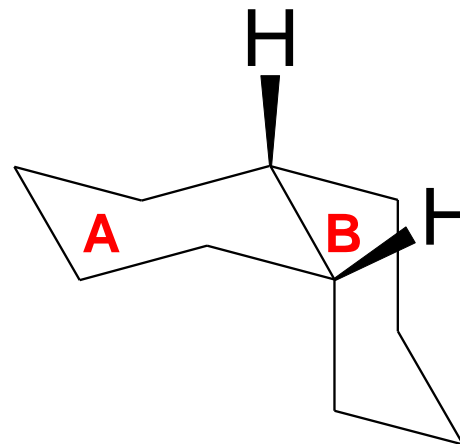


Configurational Isomers of Steroids

Fusion points between rings



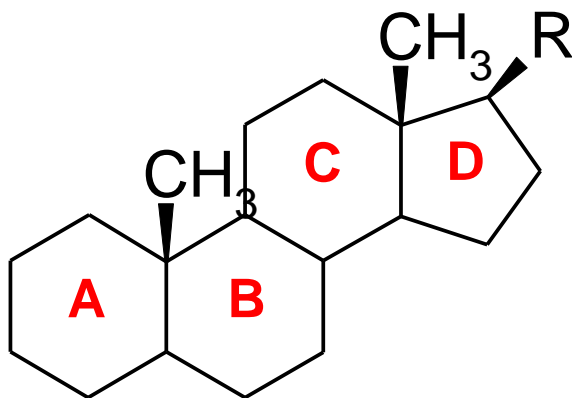
trans- configuration



cis- configuration

Configurational Isomers of Steroids

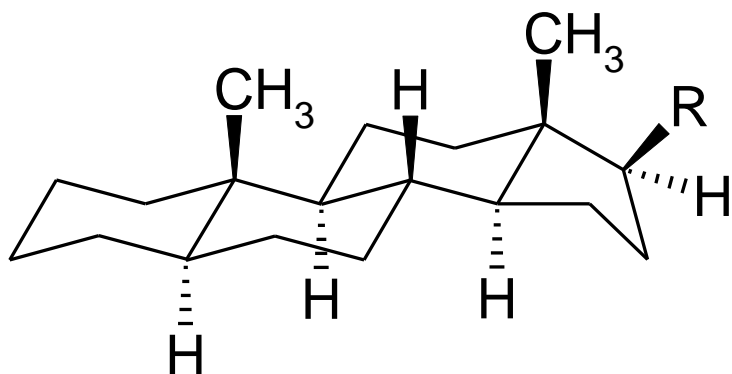
Fusion points between rings



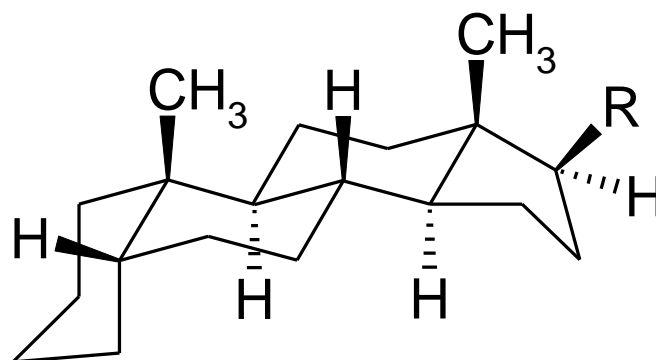
3 fusion points $\rightarrow 2^3$ isomers = 8

Configurational Isomers of Steroids

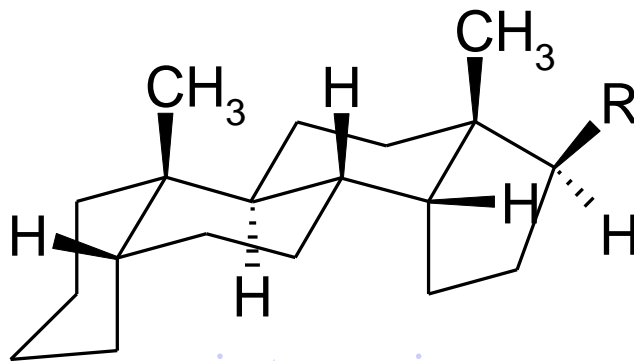
Three dimensional structure of three most common isomers



trans-trans-trans
trans-trans-trans



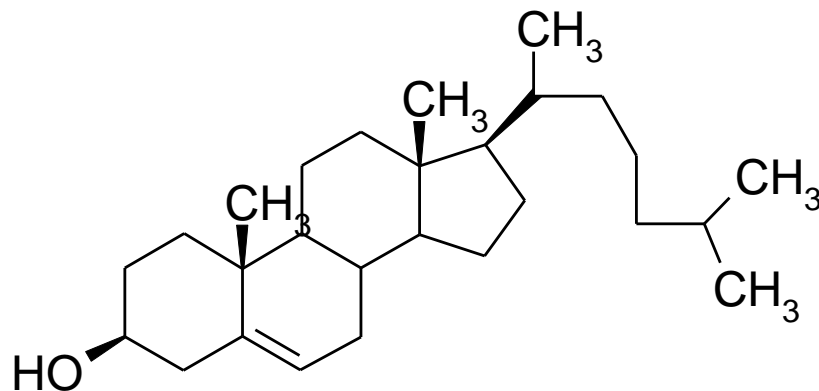
cis-trans-trans
cis-trans-trans



cis-trans-cis
cis-trans-cis

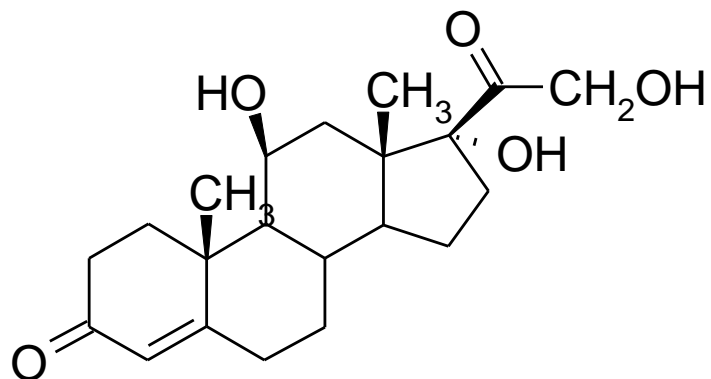
Nomenclature of Steroids

α - and β - configuration and numbering



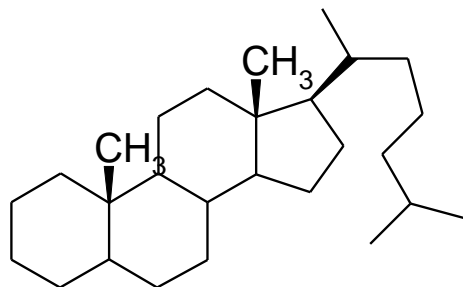
Nomenclature of Steroids

α - and β - configuration and numbering

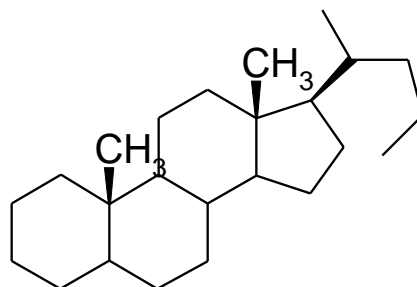


Nomenclature of Steroids

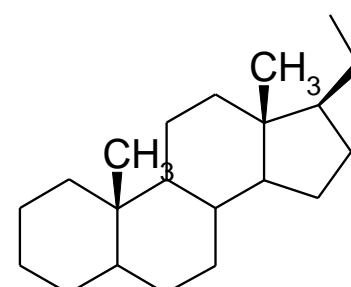
Number of Nuclear Positions and Steroid Classification



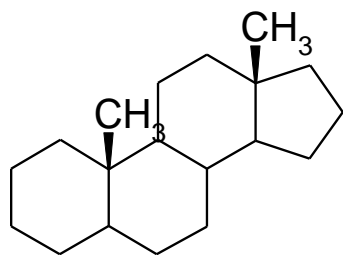
C-27 skeleton
... Cholestanes



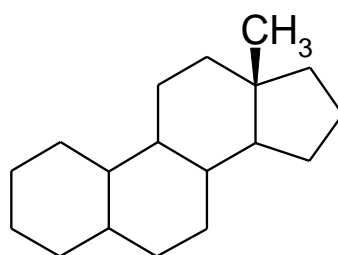
C-24 skeleton
... Cholanes



C-21 skeleton
... Pregnanes



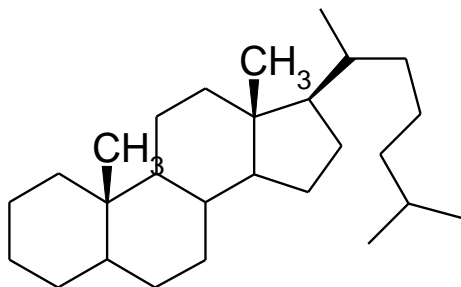
C-19 skeleton
... Androsteranes



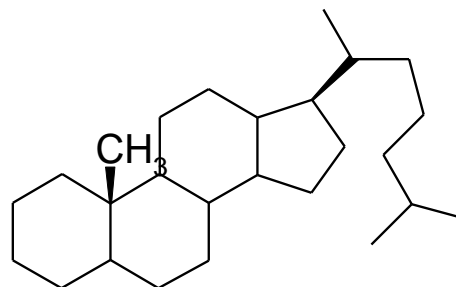
C-18 skeleton
... Estranes

Nomenclature of Steroids

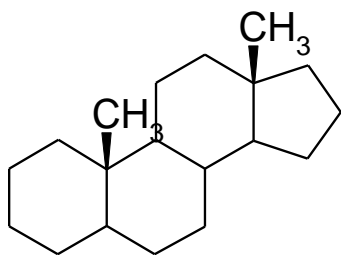
Usage of 'Nor' terminology



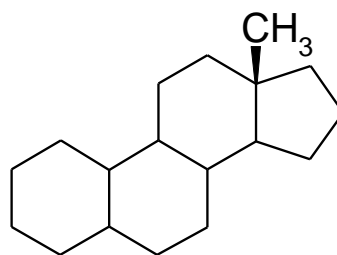
C-27 skeleton
... Cholestanes



18-Nor C-27 skeleton
... 18-nor cholestane



C-19 skeleton
... Androstanes



19-Nor C-19 skeleton
... 19-nor androstane

Thank You