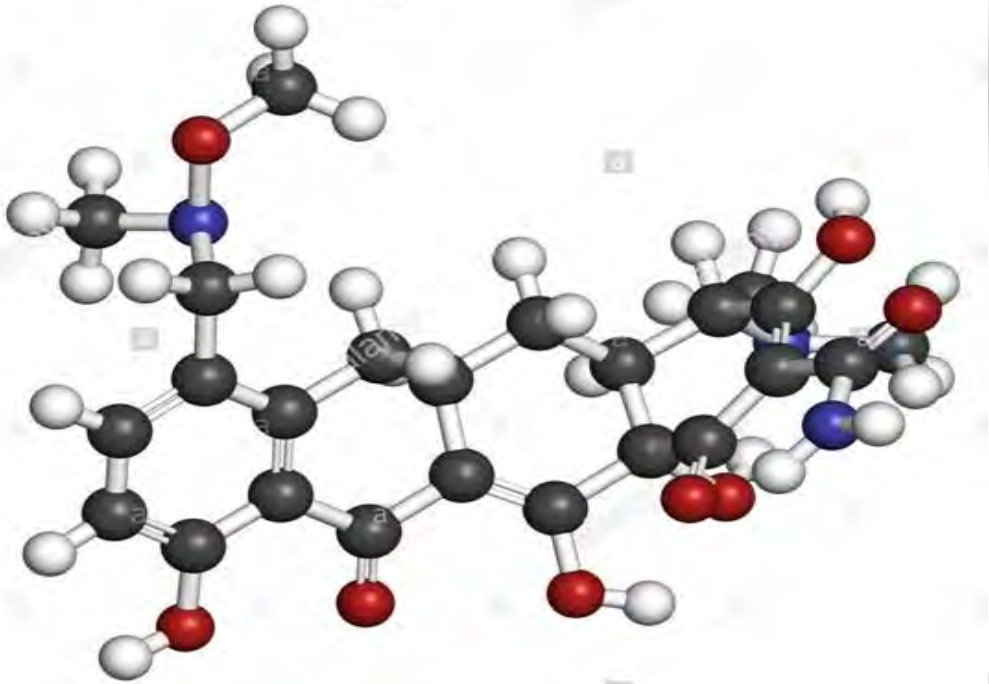


BY,

M.MINCY ,

Asst. Prof. of Chemistry

Chemotherapy

❖ Chemotherapy is the **systematic use of chemical compounds** as **treatment** for **preventing or curing diseases**.

❖ The word "**Chemo**" means **chemicals** and "**Therapy**" means **treatment**.

❖ The **chemical compounds** are to selectively **destroy the infectious micro-organism without** simultaneously **destroying the host.**

ANTIBIOTICS

- Antibiotic is a **chemical substance** **produced** by **living cells**, which is capable of **inhibiting the life processes** or **even destroying the micro organisms.**

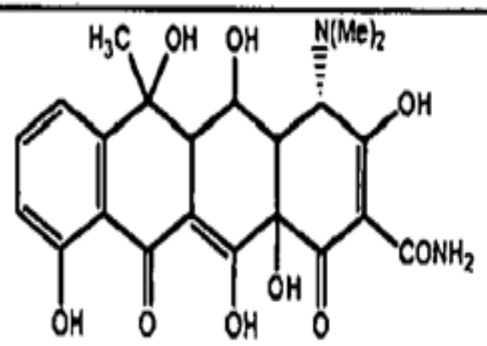
- The word **antibiotic** is derived from the word **“antibiosis”** which means **opposition of one living micro organism to another.**

- The first antibiotic, **myophenolic acid** was prepared **in 1896** and **in 1939** it was **prepared** from the **fungus Bacillus brevis by Dubos.**

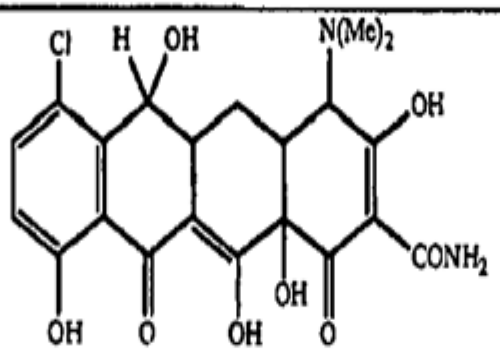
- In 1928 **Alexander Fleming** discovered **Pencillin.**

- As the antibiotics are **effective and efficient**, they are called "**miracle drugs".**

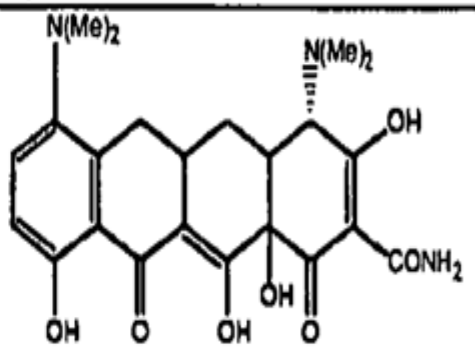
- **To prevent the attack of a germ**, the action of white blood cells and antibodies plus an antibiotic is generally enough.



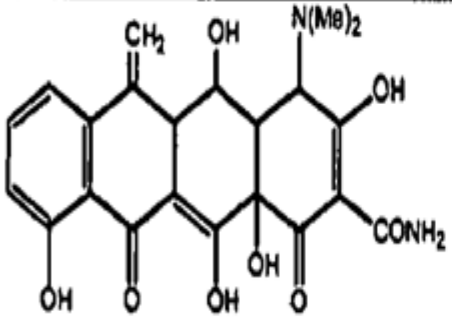
Oxytetracycline



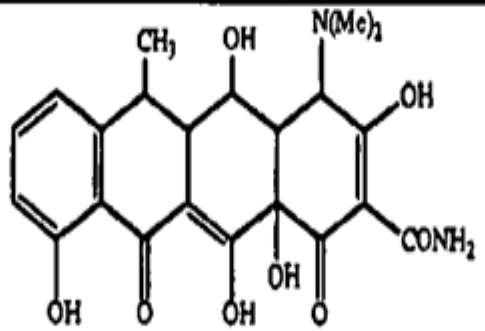
Demeclocycline



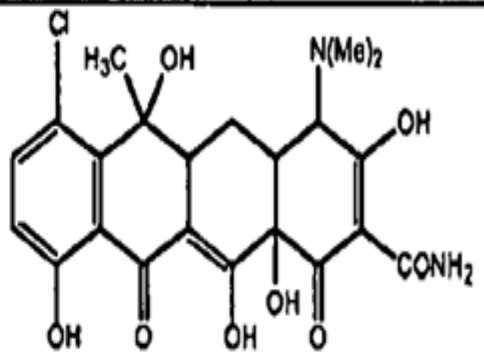
Minocycline



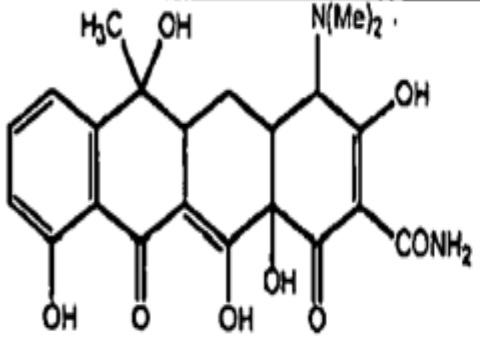
Methacycline



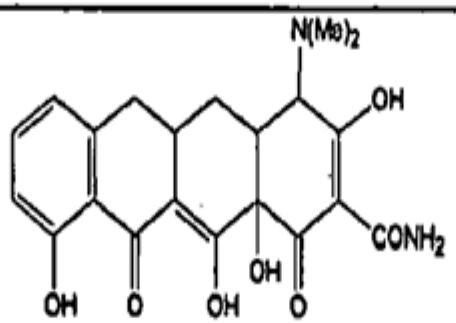
Doxycycline



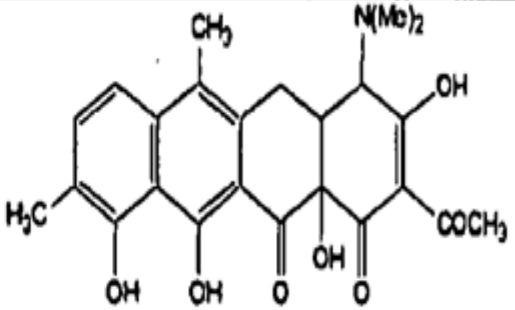
Chlortetracycline



Tetracycline



Sancycline



Chelocardin

CLASSIFICATION

They are classified into **three types**

- ✓ **Tetracycline** comes under the **third type** and it is one of the **antibiotic**

- ✓ The **third type includes pencillins, tetracylines, Choramphenicol**, etc.

TETRACYCLINE

- ✓ **Cholorotetracycline** is the **first tetracycline** and it was **discovered** by **B.M. Dugger** in **1945** from a **gold coloured soil fungus i.e., streptomycin aureofacines.**
- ✓ **In 1950** his associates isolated **oxytetracycline** and another **tetracycline**.

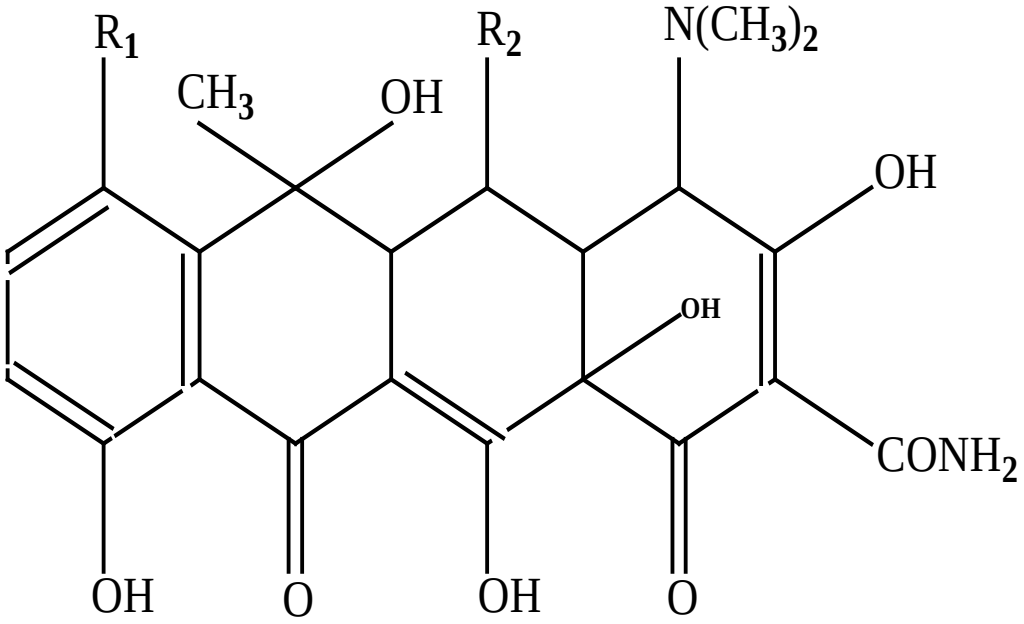
✓ **Tetracyclines** are **broad spectrum antibiotics** and are **effective against bacteria, larger viruses, protozoa, parasites and rickettsiae**.

✓ **Tetracyclines** are **absorbed** from the **gastrointestinal tract**.

✓ **Tetracyclines** are **obtained** from a new species of a**ctinomycetes** named **streptomyces aureofacines**.

✓ The comprise a group of **antibiotics characterized** by **hydronaphthalene skeleton**.

The molecular formula of tetracycline is $C_{22}H_{24}N_2O_8$ and the structure is,



Tetracycline – R_1 = H; R_2 = H

Oxy tetracycline – R_1 = H; R_2 = OH

Chlorotetracycline – R_1 = Cl; R_2 = H

They are produced by **actinomycetes** viz.,

- ✓ streptomyces aureofacines,
- ✓ streptomyces rimosus,
- ✓ streptomyces aureomycin.

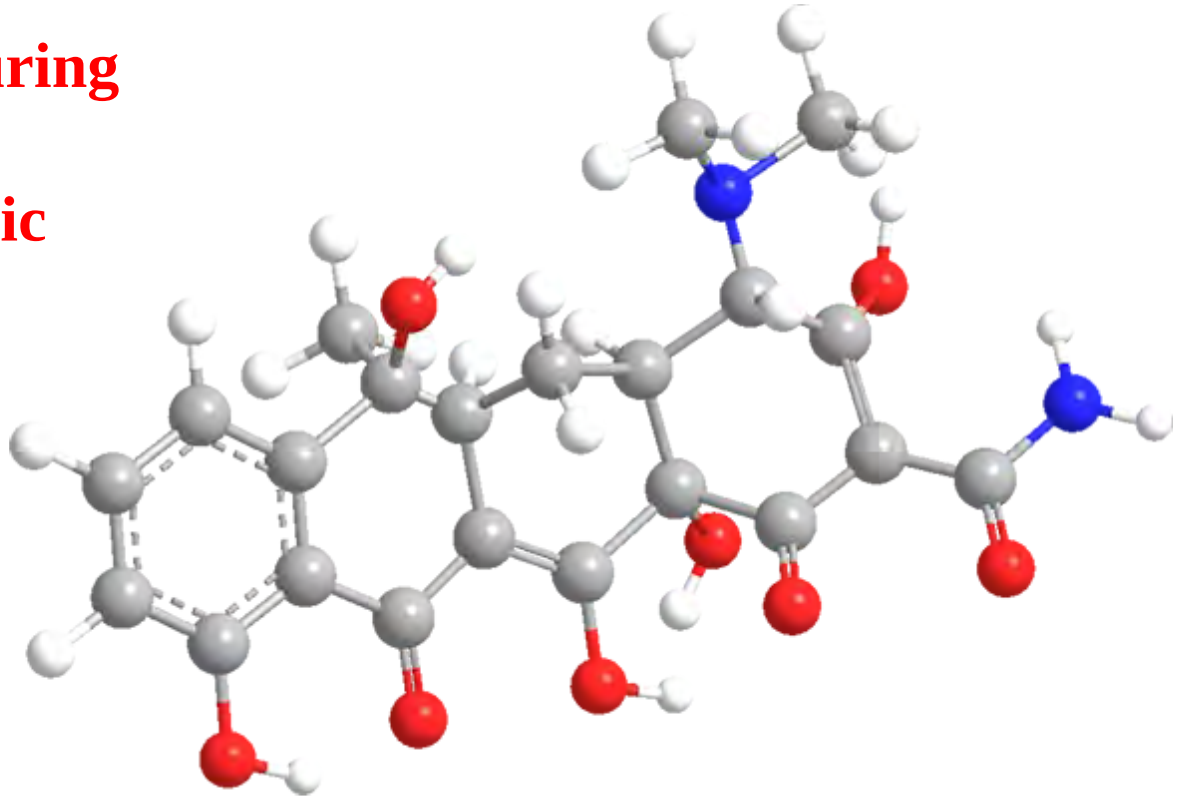
PROPERTIES

- The molecular formula of tetracycline is $C_{22}H_{24}N_2O_8$.
- These are yellow in colour, odourless, crystalline powders with a bitter taste.
- They dissolve **sparingly in water** **except** **tetracycline** and **oxytetracycline .**
- It should be stored in a dark place. It can be oxidized in the air.
- The **basic property** of tetracycline is due to the presence of $N(CH_3)_2$ group and **acedic property** is due to the presence of **phenolic group**.

TYPES

It is classified into **two types** That is,

- **Naturally occuring**
- **Semi - Synthetic**



Therapeutic uses

- These are used in **pelvic inflammatory diseases**.
- And used in **syphillis** early as well as **latent**.
- It can be used for **pneumonia**
- And it can be used in **Rickettsiea** infections
- **Tetracyclines** are broad spectrum **antibiotics** which is **effective against gram positive** and **gram negative micro organism** etc..

THANK YOU