**Tetracyclines** are a group of broad-spectrum antibiotic compounds that have a common basic structure and are either isolated directly from several species of *Streptomyces* bacteria or produced semi-synthetically from those isolated compounds.

MECHANISM OF ACTION.

Tetracycline antibiotics are protein synthesis inhibitors They inhibit the initiation of translation in variety of ways by binding to the 30S ribosomal subunit, which is made up of 16S rRNA and 21 proteins. They inhibit the binding of aminoacyl-tRNA to the mRNA translation complex. Some studies have shown that tetracyclines may bind to both 16S and 23S rRNAs Tetracyclines also have been found to inhibit matrix metalloproteinases. This mechanism does not add to their antibiotic effects, but has led to extensive research on chemically modified tetracyclines or CMTs for the treatment of rosacea, acne, diabetes and various types of neoplasms. It has been shown that tetracyclines are not only active against broad spectrum of bacteria, but also against viruses, protozoa that lack mitochondria and some noninfectious conditions. The binding of tetracyclines to cellular dsRNA (double stranded RNA) may be an explanation for their wide range of effect. It can also be attributed to the nature of ribosomal protein synthesis pathways among bacteria.

Uses.

Tetracyclines are generally used in the treatment of infections of the urinary tract, respiratory tract, and the intestines and are also used in the treatment of chlamydia, especially in patients allergic to β-lactams and macrolides; however, their use for these indications is less popular than it once was due to widespread development of resistance in the causative organisms Tetracyclines are widely used in the treatment of moderately severe acne and rosacea (tetracycline, oxytetracycline, doxycycline or minocycline).

TOXICITY

At higher oral doses **tetracycline** may produce gastrointestinal irritation, with nausea, vomiting, and diarrhea, as well as renal failure. Bone and teeth discoloration are known to occur in humans under clinical treatment with high levels of **tetracycline**.

ADVERSE EFFECT.

* Gastrointestinal toxicity.
* Alteration of intestinal and vaginal microbiota can lead to clostridium diffiville associated disease and vaginal candidiasis, respectively.
* Hepatotoxicity.
* Pseudotumor cerebri.
* Pancreatitis.