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17/mhs06/009

1. A named bacterial protein synthesis inhibitor is MACROLIDE

Examples of macrolide include azithromycin, clarithromycin and fidaxomicin.

The macrolides are a class of natural products that consist of a large macrocyclic latone ring to which one or more doozy sugars, usually cladinose and desoamine, may be attached. The lactone rings are usually 14-, 15-, or 16-membered. Macrolides belong to the polyketide class of natural products. Some macrolides have antibiotic or anti fungal activity and are used as pharmaceuticals.

MECHANISM OF ACTION

They act by preventing peptidlytransferase from adding the growing peptide attached to tRNA to the next amino acid as well as inhibition of ribosomal translations Another potential mechanism is premature dissociation of the petidly-tRNA from the ribosome. Macrolide antibiotics do so by binding reversibly to the P site on the 50s subunit of the bacterial ribosome. This action is considered to be bacteriostatic. Macrolides are actively concentrated within leukocytes, and thus are transported into the site of infection. It Prevents the transfer of the growing polypeptide chain within the 50S site so a new charged tRNA, so the micro-organisms cannot bind to the ribosome so, stops protein synthesis.

USES

Antibiotic macrolides are used to treat infections caused by Gram positive bacteria (e.g., *[Streptococcus pneumoniae](/wiki/Streptococcus_pneumoniae%22%20%5Co%20%22Streptococcus%20pneumoniae)*) and limited Gram negative bacteria (e.g., *[Bordetella pertussis](/wiki/Bordetella_pertussis%22%20%5Co%20%22Bordetella%20pertussis)*, *[Haemophilus influenzae](/wiki/Haemophilus_influenzae%22%20%5Co%20%22Haemophilus%20influenzae)*), and some respiratory tract and soft-tissue infections.The antimicrobial spectrum of macrolides is slightly wider than that of [penicillin](/wiki/Penicillin%22%20%5Co%20%22Penicillin), and, therefore, macrolides are a common substitute for patients with a penicillin allergy. Beta-hemolytic [streptococci](/wiki/Streptococcus%22%20%5Co%20%22Streptococcus), [pneumococci](/wiki/Pneumococci%22%20%5Co%20%22Pneumococci), [staphylococci](/wiki/Staphylococcus%22%20%5Co%20%22Staphylococcus), and [enterococci](/wiki/Enterococcus%22%20%5Co%20%22Enterococcus) are usually susceptible to macrolides. Unlike penicillin, macrolides have been shown to be effective against [Legionella pneumophila](/wiki/Legionella_pneumophila%22%20%5Co%20%22Legionella%20pneumophila), [mycoplasma](/wiki/Mycoplasma%22%20%5Co%20%22Mycoplasma), [mycobacteria](/wiki/Mycobacteria%22%20%5Co%20%22Mycobacteria), some [rickettsia](/wiki/Rickettsia%22%20%5Co%20%22Rickettsia), and [chlamydia](/wiki/Chlamydia_%28bacterium%29%22%20%5Co%20%22Chlamydia%20%28bacterium%29).

Erythromycin is also useful as a penicillin substitute in penicillin-allergic individuals with infections caused by staphylococci, streptococci or pneumococci

SIDE EFFECTS

1. Some macrolides are also known to cause [cholestasis](/wiki/Cholestasis%22%20%5Co%20%22Cholestasis), a condition where bile cannot flow from the liver to the duodenum.

2. Macrolides exhibit [enterohepatic recycling](/wiki/Enterohepatic_recycling%22%20%5Co%20%22Enterohepatic%20recycling); that is, the drug is absorbed in the gut and sent to the liver, only to be excreted into the [duodenum](/wiki/Duodenum%22%20%5Co%20%22Duodenum) in bile from the liver. This can lead to a buildup of the product in the system, thereby causing nausea. In infants the use of erythromycin has been associated with pyloric stenosis.

3. study found an association between erythromycin use during infancy and developing IHPS (Infantile hypertrophic pyloric stenosis) in infants . However, no significant association was found between macrolides use during pregnancy or breastfeeding

4. the combination of some macrolides and [statins](/wiki/Statins%22%20%5Co%20%22Statins) (used for lowering cholesterol) is not advisable and can lead to debilitating [myopathy](/wiki/Myopathy%22%20%5Co%20%22Myopathy).This is because some macrolides (clarithromycin and erythromycin, not azithromycin) are potent [inhibitors](/wiki/Enzyme_inhibitor%22%20%5Co%20%22Enzyme%20inhibitor) of the [cytochrome P450](/wiki/Cytochrome_P450%22%20%5Co%20%22Cytochrome%20P450) system, particularly of [CYP3A4](/wiki/CYP3A4%22%20%5Co%20%22CYP3A4).

5. Minor side effects of macrolides include nausea, vomiting, diarrhea, and ringing or buzzing in the ears (tinnitus).

TOXICITY

The pharmacokinetics of macrolides is generally complicated. New macrolides, especially clarithromycin, should be used cautiously in patients receiving concomitant medications that are metabolized by the cytochrome P-450 system and are known to interact with erythromycin.