P450 Inhibitors

Cytochrome P450 (CYP450) is a superfamily of enzymes involved in drug metabolism and bioactivation. Although these primarily membrane-associated proteins are found throughout the body, they are highly concentrated in the liver and have increased activity in the intestines and kidneys. CYP450 enzymes play roles in essential physiologic processes, such as steroid and hormone synthesis, fat-soluble vitamin metabolism, and fatty acid regulation, but their most clinically significant function is in pharmacokinetics and drug metabolism. Drugs that inhibit CYP450 enzymes (known as CYP450 Inhibitors) slow metabolism, increasing the risk of accumulation, toxicity, and adverse effects of other drugs that use the CYP450 pathway. Commonly tested CYP450 inhibitors include cimetidine, ketoconazole, erythromycin, ciprofloxacin, indinavir, acute alcohol use, isoniazid, grapefruit juice, quinidine and sulfonamides.



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Quinidine
Queen-dine
Quinidine is a class I antiarrhythmic agent that acts on fast inward sodium currents. Quinidine is notable for causing cinchonism and lupus-like syndrome.

Ciprofloxacin
Sippy-cup-rope
Ciprofloxacin is a fluoroquinolone antibiotic that is commonly used for gram negative rod infections of the urinary and GI tracts. It works by interfering with topoisomerase II.

Isoniazid
Ice-knight-zit
Isoniazid decreases the synthesis of mycolic acids, which are key components of the cell wall of Mycobacterium tuberculosis. It is the only agent used for monotherapy prophylaxis against TB.

Grapefruit Juice
Grapefruit Juice
Grapefruit juice is a well known substance that causes decreased activity of the P450 system leading to toxicities caused by slow metabolism of other P450 drugs.

Acute Alcohol Use
Acute-angle Alcohol
Acute alcohol use causes inhibition of the P450 system because the P450 enzymes are saturated by the toxic metabolites of acute ingestion.

Erythromycin (Macrolide)
Earth-throw-mice
Erythromycin is a macrolide antibiotic that is commonly used for Bordetella pertussis, Legionella pneumophilia and Mycoplasma pneumoniae. It inhibits protein synthesis by binding to the 23s RNA of the 50s ribosomal subunit, thereby blocking translocation.

Indinavir
In-the-Navy-gear
Indinavir is an HIV protease inhibitor that is used as a component of antiretroviral therapy in the treatment of HIV and AIDS.

Cimetidine
Cement-teddy
Cimetidine is a histamine H2 receptor antagonist that is commonly used in the treatment of heartburn by decreasing stomach acid production.

Sulfonamides
Sulfur-match-fondue
Sulfonamides are a class of drugs containing the sulfonamide group. Also called sulfa drugs, these medications often interact with the P450 system. Common sulfonamides are antibiotics, diuretics and sulfonylureas.

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Ketoconazole

Key-in-A-hole

Ketoconazole is commonly used for systemic mycoses. It acts by inhibiting fungal ergol sterol synthesis.

Amiodarone

Army-odor

Amiodarone is an antiarrhythmic medication which is a potent inhibitor of a number of cytochrome P450 enzymes.

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