

Cytochrome P-450 Isozymes: Substrates, Inhibitors, and Inducers

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Isozyme		Substrates		Inhibitors		Inducers	
CYP1A2	Caffeine	Olanzapine (Zyprexa)	R-Warfarin (Coumadin)	Cimetidine (Tagamet)	Isoniazid (INH)	Charcoal-broiled meat	
	Clomipramine (Anafranil)	Onansatone (Zofran)	Zileuton (Zyflo)	Ciprofloxacin (Cipro)	Mexiletine (Mexitil)	Smoking	
	Clozapine (Clozaril)	Tacrine (Cognex)		Enoxacin (Penetrex)	Norethindrone		
	Flutamide (Enlexin)	Theophylline (Theo-Dur)		Ethinyl Estradiol	Tacrine (Cognex)		
	Imipramine (Tofranil)*	Ropinirole (Requip)		Fluvoxamine (Luvox)	Zileuton (Zyflo)		
CYP2C9	Celecoxib (Celebrex)	Ibuprofen (Motrin)	Torsemide (Demadex)	Amiodarone (Cordarone)	Fluvoxamine (Luvox)	Aminoglutethimide (Cyandren)	
	Diclofenac (Voltaren)	Indomethacin (Indocin)	S-Warfarin (Coumadin)	Cimetidine (Tagamet)	Isoniazid (INH)	Barbiturates	
	Dronabinol (Marinol)	Losartan (Cozaar)	Zafirlukast (Accolate)	Clopidogrel (Plavix)	Itraconazole (Sporanox)	Carbamazepine (Tegretol)	
	Flurbiprofen (Ansaid)	Montelukast (Singulair)		Co-trimoxazole (Bactrim)	Ketoconazole (Nizoral)	Griseofulvin (Fulvicin)	
	Fluvasatin (Lescol)	Naproxen (Naprosyn)		Dulifram (Antabuse)	Metronidazole (Flagyl)	Nafcillin (Unipen)	
CYP2C19	Climepiride	Phenytin (Dilantin)		Flaviranz (Sustiva)	Sulfapyrazole (Anturane)	Phenytoin (Dilantin)	
	Glipizide (Glucotrol)?	Piroxicam (Feldene)		Fluconazole (Diflucan)	Ticlopidine (Ticlid)	Primidone (Mysoline)	
	Glibenclamide?	Tolbutamide (Orinase)		Zafirlukast (Accolate)	Zafirlukast (Accolate)	Rifampin (Rimactane)	
	Amitriptyline (Elavil)*	Lansoprazole (Prevacid)	Phenytoin (minor pathway)	Flaviranz (Sustiva)	Omeprazole (Prilosec)		
	Carisoprodol (Soma)	Mephenytoin	Proguanil*	Felbamate (Felbatol)	Ticlopidine (Ticlid)		
CYP2D6	Citalopram (Celexa)	Pantoprazole (Protonix)	Rabeprazole (Aciphex)	Fluconazole (Diflucan)			Note: CYP2D6 appears relatively resistant to enzyme induction.
	Diazepam (Valium)*	Olanzapine (Zyprexa)	R-Warfarin (Coumadin)	Fluoxetine (Prozac)*			
	Imipramine (Tofranil)*	Omeprazole (Prilosec)		Fluvoxamine (Luvox)			
	Amitriptyline (Elavil)*	Pentamidine (Pentam)					
	Carvedilol (Coreg)	Fluoxetine (Prozac)*	Paroxetine (Paxil)	Amiodarone (Cordarone)			
CYP3A4	Alfentanil (Alfenta)	Fluvoxamine (Luvox)	Perohepazine (Trilafon)	Chloroquine (Aralen)	Quinidine (Quinidex)	Aminoglutethimide (Cyandren)	
	Alprazolam (Xanax)	Haloperidol (Haldol)	Propafenone (Rythmol)	Cimetidine (Tagamet)	Quinine	Barbiturates	
	Amiodarone (Cordarone)	Hydrocodone*	Proparolol (Inderal)	Diphenhydramine (Benadryl)	Ritonavir (Norvir)	Carbamazepine (Tegretol)	
	Astemizole*	Imipramine (Tofranil)*	Risperidone (Risperdal)*	Fluoxetine (Prozac)*	Sertraline (Zoloft) (weak)	Dexamethasone	
	Bepiridil (Vascor)	Dextromethorphan	Thioridazine (Mellaril)	Haloperidol (Haldol)	Terbinafine (Lamisil)	Flaviranz (Sustiva)	
CYP3A4	Bromocriptine (Parlodel)	Methamphetamine	Timolol (Blocadren)	Mibefradil (Posicor)	Thioridazine (Mellaril)	Glutethimide	
	Buspirone (Buspar)	Metoprolol (Lopressor)	Tolterodine (Detrol)*	Paroxetine (Paxil)		Griseofulvin (Fulvicin)	
	Carbamazepine (Tegretol)	Mexiletine (Mexitil)	Tramadol (Ultram)*	Perphenazine (Trilafon)		Nevirapine (Viramune)	
	Cisapride (Propulsid)	Northriptyline (Pamelor)	Trazodone (Desyrel)	Propafenone (Rythmol)		Phenytoin (Dilantin)	
	Citalopram (Celexa)	Oxycodone (Percocet)	Venlafaxine (Effexor)	Propoxyphene (Darvon)		Primidone (Mysoline)	
CYP3A4	Clarithromycin (Biaxin)	Ethinyl Estradiol	Nitrendipine	Clarithromycin (Biaxin)	Quetiapine (Seroquel)	Rifampin (Rimactane)	
	Cyclosporine (Neoral) ⊕	Etiopside (Vepesid) ⊕	Pacitaxel (Taxol) ⊕	Danazol (Danocrine)	Quinidine (Quinidex)	Trogilazone (Rezulin)	
	Dapone	Felodipine (Plendil)	Pimozide (Orap)	Delavirdine (Rescriptor)	Quinine		
	Delavirdine (Rescriptor)	Fentanyl (Sublimaze)	Prednisolone	Diltiazem (Cardizem) ⊕	Quinupristin/dalfopristin (Synercid)		
	Dexamethasone ⊕	Flutamide (Eulexin)	Quetiapine (Seroquel)	Erythromycin (E-Mycin)	Ritonavir (Norvir)		
CYP3A4	Diazepam (Valium)	Ilofamide (Ilex)	Quinine	Ethinyl Estradiol	Saquinavir (Invirase)		
	Diltiazem (Cardizem) ⊕	Indinavir (Crixivan)	Ritonavir (Mycobutin)	Fluconazole (Diflucan) (weak)	Troleanomycin (TAO)		
	Disopyramide (Norpace)	Iradipine (Dynacirc)	Saquinavir (Invirase)	Fluoxetine (Prozac)* (weak)	Verapamil (Calan) ⊕		
	Doxorubicin (Adriamycin)	Itraconazole (Sporanox)	Sertraline (Zoloft)	Fluvoxamine (Luvox)	Zafirlukast (Accolate)		
	Flaviranz (Sustiva)	Ketoconazole (Nizoral)	Sildenafil (Viagra)	Grapefruit juice	Zileuton		
CYP3A4	Ergotamine (Ergomar)	Lidocaine	Sildenafil (Viagra)	Indinavir (Crixivan)			
	Erythromycin (E-Mycin)	Loratadine (Claritin)	Simvastatin (Zocor)	Isoniazid (INH)			
		Losartan (Cozaar)	Simvastatin (Zocor)	Itraconazole (Sporanox)			
		Lovastatin (Mevacor)	Tacrolimus (Prograf) ⊕	Ketoconazole (Nizoral)			
		Methadone	Tamoxifen (Nolvadex)	Metronidazole (Flagyl)			
CYP3A4		Methylprednisolone	Terfenadine*	Methylprednisolone			
		Mibefradil (Posicor)	Testosterone	Mibefradil (Posicor)			
		Miconazole (Monistat)	Theophylline (minor pathway)	Miconazole (Monistat)			
		Midazolam (Versed)	Triazolam (Halcion)	Nefazodone (Serzone)			
		Nefazodone (Serzone)	Nicardipine (Cardene) ⊕	Nelfinavir (Viracept)			
CYP3A4		Nifedipine (Adalat) ⊕	Vinblastine (Velban) ⊕	Norethindrone			
		Nimodipine (Nimotop)	Vincristine (Oncovin) ⊕	Norfloracin (Norflex)			
		Nisoldipine (Sular)	R-Warfarin (Coumadin)	Oxiconazole (Oxistat)			
			Zolpidem (Ambien)	Prednisone			

* = drugs with active metabolites ⊕ = Substrate for P-glycoprotein