

How to Use This Table

This is an illustrative guide to the cytochrome P450 contribution to drug interactions likely for medication pairs that are substrates, inhibitors or inducers of the same enzyme. More than one-half of patients also carry genetic variations in CYP 1A2, 2C9, 2C19, and 2D6 genes that can dramatically alter patient drug exposures, and for which DNA testing can be ordered. The GeneMedRx drug interaction software provides a more complete and automated tool for comprehensive medication management, with optional input of genetic variations, OTCs, foods, herbals, and other relevant patient factors to produce drug interaction reports based on the cumulative effect of all known drug metabolism variables. Obtain a fully functional 30-day free trial at www.GeneMedRx.com or call 1 877 431-4362.

P450 DRUG-INTERACTIONS SUBSTRATES TABLE (compiled by Jessica Oesterheld, M.D.)

Substrates (primary enzyme for metabolism) <i>italics = brand name</i> {brackets} = minor or less potent bold = potent (p) = pro-drug > = entire class or group						
1A2	2B6	NAT2	2C19	2C9	2D6	3A4,5,7
<p>Psychotropics: amitriptyline chlorpromazine clomipramine clozapine duloxetine fluphenazine flvoxamine imipramine melatonin {mirtazapine} {olanzapine} perphenazine propafenone {propranolol} ramelteon <i>Rozerem</i> thioridazine thiothixene trifluoperazine</p> <p>Other: anagrelide caffeine cinacalcet cyclobenzaprine <i>Flexeril</i> dacarbazine erlotinib flutamide frovatriptin lidocaine mexiletine naproxen ondansetron {phenacetin} R-warfarin propranolol R-warfarin riluzole <i>Rilutek</i> ropinirole ropivacaine <i>Naropin</i> tacrine <i>Cognex</i> theophylline tizanidine <i>Zanaflex</i> zileuton <i>Zyflo</i> zolmitriptan <i>Zomig</i></p>	<p>bupropion cyclophosphamide (p) efavirinez <i>Sustiva</i> ifosphamide (p) ketamine meperidine methadone {nicotine} propofol sertraline selegiline {tamoxifen} testosterone</p>	<p>caspofungin hydralazine isoniazid procainamide retigabine zonisamide</p> <p>Sulfonamides: sulfapyridine sulfamethazine sulfadiazine sulfasalazine carcinogenic aromatic and heterocyclic amines benzidine beta- naphthylamine</p>	<p>Psychotropics: amitriptyline citalopram clomipramine cliazepam escitalopram flunitrazepam {fluoxetine} imipramine moclobemide sertraline trimipramine</p> <p>Anticonvulsants: mephenytoin phenytoin</p> <p>Proton Pump Inhibitors: {esomeprazole} lansoprazole omeprazole {pantoprazole}</p> <p>Others: carisoprodol <i>Soma</i> cilostazol clopidogrel cyclophosphopha mide (p) ifosphamide (p) nelfinavir prguanil (p) <i>Malarone</i> propranolol R-warfarin tolbutamide voriconazole</p>	<p>Psychotropics: fluoxetine {sertraline} valproic acid</p> <p>NSAIDs: aceclofenac celecoxib diclofenac flurbiprofen ibuprofen indomethacin lornoxicam meloxicam {naproxen} piroxicam suprofen tenoxicam</p> <p>Hypoglycemics: chlorpropamide glipizide <i>Glucotrol</i> Glimepiride <i>Amaryl</i> glyburide <i>DiaBeta</i> nateglinide <i>Starlix</i> {rosiglitazone} {<i>Avandia</i>} tolbutamide <i>Orinase</i></p> <p>Others: bosentan candesartan <i>Atacand</i> fluvastatin <i>Lescol</i> irbesartan losartan <i>Cozaar (p)</i> phenobarbital phenytoin sulfa drugs {tamoxifen} S-warfarin tetrahydro- cannabinol (marijuana) torsemide <i>Tomide</i></p>	<p>Psychotropics: amphetamines amitriptyline ariprazole atomoxetine benztropine chlorpromazine {citalopram} clomipramine desipramine doxepin duloxetine fluoxetine flvoxamine haloperidol imipramine mirtazapine nortriptyline paroxetine perphenazine risperidone sertraline trazodone triazolam zaleplon <i>Lunesta</i> {ziprasidone} zolpidem <i>Ambien</i></p> <p>Antihistamines: chlorpheniramine diphenhydramine hydroxyzine <i>Atarax</i></p> <p>Beta Blockers: carvedilol metoprolol propranolol timolol</p> <p>>Cough Medicines</p> <p>Opiates: codeine(p) hydrocodone (p) {oxycodone} tramadol</p> <p>Others: dolesetron(p) doxorubicin encainide MDMA (ecstasy) metoclopramide <i>Reglan</i> mexiletine phenacetin propafenone <i>Rythmol</i> {ranitidine} {<i>Zantac</i>} tamoxifen(p) tolterodine <i>Detrol</i> tropisetron</p>	<p>Psychotropics: alprazolam amitriptyline ariprazole buspirone carbamazepine citalopram {clomipramine} {clozapine} {diazepam} estazolam eszopiclone fluoxetine <i>Lunesta</i> fluoxetine haloperidol imidazole nefazodone pimozide quetiapine risperidone sertraline trazodone triazolam zaleplon <i>Sonata</i> {ziprasidone} zolpidem <i>Ambien</i></p> <p>Drugs of abuse/treatment: buprenorphine cocaine fentanyl ketamine methadone oxycodone phencyclidine <i>PCP</i></p> <p>Antibiotics/ Antifungals: macrolides (not azithromycin) itraconazole ketoconazole telithromycin <i>Ketek</i></p> <p>Anticonvulsants: carbamazepine ethosuximide felbamate tiagabine <i>Gabitril</i> Zonisamide <i>Zonegran</i></p> <p>Antihistamines: Desloratadine <i>Clarinet</i> fexofenadine <i>Allegra</i> loratadine <i>Claritin</i></p> <p>Asthma Medication: fluticasone <i>Flovent</i> salmeterol <i>Serevent</i> zileuton <i>Zyflo</i></p> <p>>Calcium Channel Blockers</p> <p>Hormones/chemo therapeutics: cortisol desogestrel (p) ethinyl estradiol OCs progestins /progesterone vincristine and others</p> <p>Others: aprepitant <i>Emend</i> cinacalcet esomeprazole granisetron nateglinide <i>Starlix</i> omeprazole pioglitazone <i>Actos</i> quinidine sildenafil Statins (atorvastatin, lovastatin, simvastatin) tolterodine <i>Detrol</i></p>

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P450 DRUG-INTERACTIONS INHIBITORS TABLE (compiled by Jessica Oesterheld, M.D.)

Inhibitors (reduces or blocks the ability of the enzyme to metabolize the substrates)						
1A2	2B6	NAT2	2C19	2C9	2D6	3A4,5,7
acyclovir amiodarone caffeine cimetidine ciprofloxacin enoxacin echinacea enoxacin famotidine flutamide fluvoxamine grapefruit juice lidocaine lomefloxacin mexiletine <i>Mexitil</i> moclobemide norfloxacin ofloxacin oral contraceptives perphenazine phenacetin propafenone ropinirole tacrine ticlopidine tocinamide verapamil zileuton <i>Zyflo</i>	clopidogrel <i>Plavix</i> efavirenz fluoxetine fluvoxamine ketoconazole memantine nelfinavir oral contraceptives paroxetine ritonavir thiotepa ticlopidine <i>Ticlid</i>	acetaminophen	artemisinin chloramphenicol delavirdine efavirenz esomeprazole felbamate (fluconazole) (fluoxetine) fluvoxamine indomethacin inh modafinil <i>Provigil</i> omeprazole <i>Prilosec</i> oral contraceptives oxcarbazepine ticlopidine topiramate voriconazole	amiodarone anastrozole cimetidine delavirdine efavirenz fenofibrate <i>Tricor</i> fluconazole (fluoxetine) fluvoxamine fluvastatin isoniazid ketoconazole leflunomide modafinil phenylbutazone (sertraline) sulfamethoxazole sulfaphenazole tamoxifen teniposide valproic acid voriconazole <i>Vfend</i> (zafirlukast), (Accolate) 5-fluorouracil	amiodarone (amitriptyline) bupropion celecoxib chlorpheniramine chlorpromazine cimetidine cinacalcet (citalopram) chlorpheniramine clomipramine (desipramine) diphenhydramine doxepin duloxetine (fluvoxamine) fluoxetine goldenseal halofantrine haloperidol (hydroxyzine) imipramine methadone metoclopramide moclobemide paroxetine pirozide propafenone quinidine/quinine ritonavir (sertraline) terbinafine thioridazine ticlopidine	amiodarone amprenavir aprepitant -initially atazanavir <i>Reyataz</i> (cimetidine) ciprofloxacin clarithromycin delavirdine diltiazem doxycycline echinacea enoxacin erythromycin fluconazole fluvoxamine grapefruit juice imatinib indinavir itraconazole ketoconazole miconazole nefazodone nelfinavir ritonavir and boosted PIs saquinavir telithromycin verapamil voriconazole

P450 DRUG-INTERACTIONS INDUCERS TABLE (compiled by Jessica Oesterheld, M.D.)

Inducers (increases the ability of the enzyme to metabolize the substrates)						
1A2	2B6	NAT2	2C19	2C9	2D6	3A4,5,7
carbamazepine charbroiled meat cigarette smoke cruciferous veggies esomeprazole griseofulvin insulin lansprazole marijuana smoke moricizine omeprazole rifampin ritonavir	lopinavir/ritonavir phenobarbital phenytoin rifampin	retinoic acid	ginkgo biloba rifampin St John's Wort	aprepitant-long term barbituates bosentan carbamazepine rifampin-chronic ritonavir and boosted PIs St John's Wort-long term	?rifampin	aprepitant -long term barbituates bosentan carbamazepine efavirenz felbamate glucocorticoids modafinil nafcillin nevirapine (oxcarbazepine) phenytoin primidone rifampins St John's Wort pioglitazone .Actos topiramate at >200 mg/d

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