Flockhart Table ™

"The effective, intelligent management of many problems related to drug interactions in clinical prescribing can be helped by an understanding of how drugs are metabolized. Specifically, if a prescriber is aware of the dominant cytochrome P450 isoform involved in a drug's metabolism, it is possible to anticipate, from the inhibitor and inducer lists for that enzyme, which drugs might cause significant interactions."

- Substrates: drugs that are metabolized as substrates by the enzyme
- Inhibitors: drugs that prevent the enzyme from metabolizing the substrates
- Activators: drugs that increase the enzyme's ability to metabolize the substrates
  Taken from: http://medicine.iupui.edu/CLINPHARM/ddis/pocket-card

Furthermore, Pocket Cards can be ordered from: http://medicine.iupui.edu/CLINPHARM/ddis/pocket-card

P450 Drug Interaction Table

SUBSTRATES drugs that are metabolized as substrates by the enzyme

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
amitriptyline	artemisinin	amodiaquine[2]	**NSAIDs:**	**PPIs:**	tamoxifen:	**Anesthetics:**	**Macrolide antibiotics:**
caffeine[2]	bupropion[1]	cerivastatin	diclofenac[1]	esomeprazole	**TAMOXIFEN GUIDE**	enflurane	clarithromycin
clomipramine	cyclophosphamide	paclitaxel	ibuprofen	lansoprazole		halothane	erythromycin[2] (not 3A5)
clozapine	efavirenz[1]	repaglinide	lornoxicam	omeprazole2	**Beta Blockers:**	isoflurane	NOT azithromycin telithromycin
cyclobenzaprine	ifosphamide	sorafenib	meloxicam	pantoprazole	carvedilol	methoxyflurane	
duloxetine	ketamine	torsemide	S-naproxen→Nor		S-metoprolol	sevoflurane	
estradiol	meperidine		piroxicam	**Anti-epileptics:**	propafenone		
fluvoxamine	methadone		suprofen	diazepam→Nor	timolol	acetaminophen→NAPQI	
haloperidol	nevirapine			phenytoin(O)		aniline2	**Anti-arrhythmics:**
imipramine N-DeMe	propafol		**Oral Hypoglycemic Agents:**	S-mephenytoin[1]	**Antidepressants:**	benzene	quinidine→3-OH (not 3A5)
mexiletine	selegiline			phenobarbitone	amitriptyline	chlorzoxazone1	
nabumetone	sorafenib		tolbutamide[1]		clomipramine	ethanol	
naproxen			glipizide	amitriptyline	desipramine	N,N-dimethylformamide	**Benzodiazepines:**
olanzapine				carisoprodol	fluoxetine	theophylline→8-OH	
ondansetron				citalopram	imipramine		
phenacetin[1]→ acetaminophen				chloramphenicol			

Substrates continued

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
→NAPQI			**Angiotensin II Blockers:**	clomipramine	paroxetine		alprazolam
propranolol			losartan	clopidogrel	venlafaxine		diazepam→3OH
riluzole			irbesartan	cyclophosphamide			midazolam[1]
ropivacaine				hexobarbital	**Antipsychotics:**		triazolam[2]
tacrine$_2$			**Sulfonylureas:**	imipramine N-DeME	haloperidol		
theophylline$_2$			glyburide	indomethacin	perphenazine		**Immune Modulators:**
tizanidine			glibenclamide	labetalol	risperidone→9-OH		cyclosporine
triamterene			glipizide	R-mephobarbital	thioridazine		tacrolimus (FK506)
verapamil			glimepiride	moclobemide	zuclopenthixol		
(R)warfarin			tolbutamide	nelfinavir			**HIV Antivirals:**
zileuton				nilutamide	alprenolol		indinavir
zolmitriptan			amitriptyline	primidone	amphetamine		nelfinavir
			celecoxib	progesterone	aripiprazole		ritonavir
			fluoxetine	proguanil	atomoxetine		saquinavir
			fluvastatin	propranolol	bufuralol[1]		
			glyburide	teniposide	chlorpheniramine		**Prokinetic:**
			nateglinide	R-warfarin→8-OH	chlorpromazine		cisapride
			phenytoin-4-OH2	voriconazole	clonidine		
			rosiglitazone		codeine (→O-desMe)		**Antihistamines:**
			tamoxifen		debrisoquine[2]		astemizole
			torsemide		dexfenfluramine		chlorpheniramine
			valproic acid		dextromethorphan[1]		terfenadine[2]
			S-warfarin[1]		donepezil		
			zakirlukast		duloxetine		**Calcium Channel Blockers:**
					encainide		amlodipine
					flecainide		diltiazem
					fluvoxamine		felodipine
					lidocaine		lercanidipine
					metoclopramide		nifedipine[2]
					methoxyamphetamine		
					mexiletine		

Substrates continued

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
					minaprine nebivolol nortriptyline ondansetron oxycodone perhexiline phenacetin phenformin promethazine propafenone propranolol risperidone sparteine tramadol		nisoldipine nitrendipine verapamil **HMG CoA Reductase Inhibitors:** atorvastatin cerivastatin lovastatin NOT pravastatin NOT rosuvastatin simvastatin **Steroid 6beta-OH:** estradiol hydrocortisone progesterone testosterone[1] **Miscellaneous:** alfentanil aprepitant aripiprazole boceprevir buspirone carbamazepine cafergot caffeine→TMU cilostazol cocaine codeine-N-

Substrates continued

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
							demethylation
							dapsone
							dexamethasone
							dextromethorphan[2]
							docetaxel
							domperidone
							eplerenone
							fentanyl
							finasteride
							gleevec
							haloperidol
							irinotecan
							LAAM
							lidocaine
							methadone
							nateglinide
							nevirapine
							ondansetron
							pimozide
							propranolol
							quetiapine
							quinine
							risperidone
							romidepsin
							salmeterol
							sildenafil
							sirolimus
							sorafenib
							sunitinib
							tamoxifen
							taxol
							telaprevir

Substrates continued

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
							terfenadine torisel trazodone vemurafenib vincristine zaleplon ziprasidone zolpidem

INHIBITORS drugs that prevent the enzyme from metabolizing the substrates

Inhibitors compete with other drugs for a particular enzyme thus affecting the optimal level of metabolism of the substrate drug which in many cases affect the individual's response to that particular medication, e.g. making it ineffective.

■A **Strong inhibitor** is one that causes a > 5-fold increase in the plasma AUC values or more than 80% decrease in clearance.
■A **Moderate inhibitor** is one that causes a > 2-fold increase in the plasma AUC values or 50-80% decrease in clearance.
■A **Weak inhibitor** is one that causes a > 1.25-fold but < 2-fold increase in the plasma AUC values or 20-50% decrease in clearance.

FDA preferred[1] and acceptable[2] **inhibitors** for in vitro experiments.*

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
■fluvoxamine ■ciprofloxacin ■cimetidine amiodarone efavirenz fluoroquinolones fluvoxamine furafylline[1]	clopidogrel thiotepa ticlopidine[2] voriconazole	■gemfibrozil[2] ■trimethoprim[2] glitazones montelukast[1] quercetin[1]	■fluconazole[2] ■amiodarone efavirenz fenofibrate fluconazole fluvastatin fluvoxamine[2] isoniazid	PPIs: esomeprazole lansoprazole omeprazole2 pantoprazole Other: chloramphenicol	■bupropion ■cinacalcet ■fluoxetine ■paroxetine ■quinidine[1] ■duloxetine ■sertraline ■terbinafine	diethyl-dithiocarbamate[2] disulfiram	HIV Antivirals: ■indinavir ■nelfinavir ■ritonavir ■clarithromycin ■itraconazole[1] ■ketoconazole ■nefazodone ■saquinavir

Inhibitors continued

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
interferon methoxsalen mibefradil ticlopidine			lovastatin metronidazole paroxetine phenylbutazone probenicid sertraline sulfamethoxazole sulfaphenazole[1] teniposide voriconazole zafirlukast	cimetidine felbamate fluoxetine fluvoxamine indomethacin isoniazid ketoconazole modafinil oral contraceptives oxcarbazepine probenicid ticlopidine2 topiramate voriconazole	amiodarone cimetidine celecoxib chlorpheniramine chlorpromazine citalopram clemastine clomipramine cocaine diphenhydramine doxepin doxorubicin escitalopram halofantrine haloperidol histamine H1 receptor antagonists hydroxyzine levomepromazine methadone metoclopramide mibefradil midodrine moclobemide perphenazine promethazine ranitidine reduced-haloperidol ritonavir ticlopidine tripelennamine		suboxone telithromycin aprepitant erythromycin fluconazole grapefruit juice verapamil[2] diltiazem cimetidine amiodarone NOT azithromycin chloramphenicol boceprevir ciprofloxacin delaviridine diethyl-dithiocarbamate fluvoxamine gestodene imatinib mibefradil mifepristone norfloxacin norfluoxetine starfruit telaprevir voriconazole

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7

INDUCERS drugs that increase the enzyme's ability to metabolize the substrates

1A2	2B6	2C8	2C9	2C19	2D6	2E1	3A4,5,7
broccoli brussel sprouts carbamazepine char-grilled meat insulin methylcholanthrene[1] modafinil nafcillin beta-naphthoflavone[1] omeprazole[1] rifampin tobacco	artemisinin carbamazepine efavirenz nevirapine phenobarbital phenytoin rifampin	rifampin[1]	carbamazepine enzalutamide nevirapine phenobarbital rifampin secobarbital St. John's Wort	carbamazepine efavirenz enzalutamide norethindrone NOT pentobarbital prednisone rifampicin[1] ritonavir St. John's Wort	dexamethasone rifampin	ethanol isoniazid	HIV Antivirals: efavirenz nevirapine barbiturates carbamazepine enzalutamide glucocorticoids modafinil oxcarbazepine phenobarbital[2] phenytoin[2] pioglitazone rifabutin rifampin[1] St. John's Wort troglitazone[1]

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