

SANFORD PHARMACOGENETICS PANEL

Pharmacogenomics (PGx) is the study of how genes affect the way a body processes medications. Medication processing can be controlled by more than one gene. Sanford includes testing for PGx genes based on clinically supported data. The level of scientific support can vary depending on the medication and genes. The Clinical Pharmacogenetic Implementation Consortium (CPIC) and the Food and Drug Administration (FDA) continuously evaluate clinical data to make updates to the affected medications.

Your PGx results may guide your doctor in selection of medication or dose of medication when starting certain commonly prescribed medications. PGx analysis is not available for all medications. PGx results alone will not tell you exactly how you will respond to a medication as other factors also play a role with how you respond to medications.

For individuals with established care at Sanford Health, a pharmacist will review your PGx results and contact your doctor with any recommendations. Your test results are also stored in your medical record for future use.

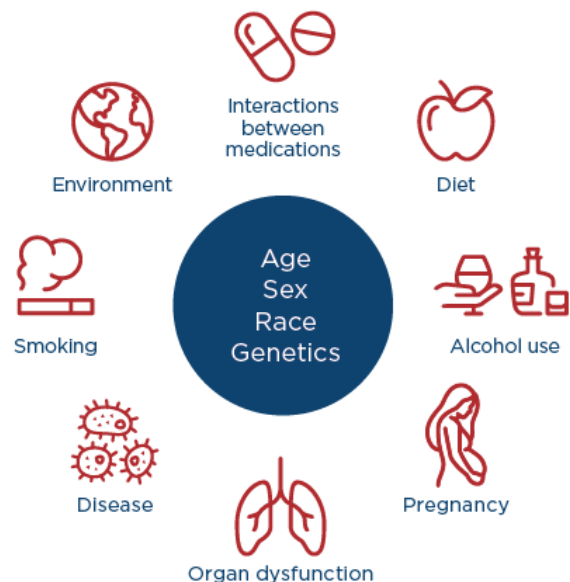
DISCLAIMER:

Is it **not recommended** to make any changes to your medications without talking to your doctor first

Some factors that influence medication metabolism:

Here is an example for a given medication:

-  →  Patient A may see the best results with **two** tablets of a given medication.
-  →  Patient B may only need **one** tablet for treatment.
-  →  Patient C may only need **one-half** of a tablet of the same medication.
-  →  Patient D may need to take a **different medication** to see the same benefits.



Pharmacogenetics Panel (14 genes) LBOR0230

MEDICATION	GENE(S)
Mental Health	
citalopram (Celexa)	CYP2C19
escitalopram (Lexapro)	CYP2C19
fluvoxamine (Luvox)	CYP2D6
paroxetine (Paxil)	CYP2D6
sertraline (Zoloft)	CYP2C19, CYP2B6
amitriptyline (Elavil)	CYP2C19, CYP2D6
clomipramine (Anafranil)	CYP2C19, CYP2D6
desipramine (Norpramin)	CYP2D6
doxepin (Sinequan)	CYP2C19, CYP2D6
imipramine (Tofranil)	CYP2C19, CYP2D6
nortriptyline (Pamelor)	CYP2D6
trimipramine (Surmontil)	CYP2C19, CYP2D6
vortioxetine (Trintellix)	CYP2D6
venlafaxine (Effexor, Effexor XR)	CYP2D6
atomoxetine (Strattera)	CYP2D6
aripiprazole (Abilify)	CYP2D6
brexpiprazole (Rexulti)	CYP2D6
iloperidone (Fanapt)	CYP2D6
pimozide (Orap)	CYP2D6
Analgesics	
celecoxib (Celebrex)	CYP2C9
flurbiprofen (Ansaid)	CYP2C9
ibuprofen (Advil, Motrin)	CYP2C9
meloxicam (Mobic)	CYP2C9
piroxicam (Feldene)	CYP2C9
codeine (Tylenol with codeine, Fiorinal with codeine, etc.)	CYP2D6
tramadol (Ultram)	CYP2D6
Statins	
atorvastatin (Lipitor)	SLCO1B1
fluvastatin (Lescol)	SLCO1B1, CYP2C9
lovastatin (Mevacor)	SLCO1B1
pitavastatin (Livalo)	SLCO1B1
pravastatin (Pravachol)	SLCO1B1
rosuvastatin (Crestor)	SLCO1B1, ABCG2
simvastatin (Zocor)	SLCO1B1
Antiplatelet	
clopidogrel (Plavix)	CYP2C19
Gastrointestinal	
dexlansoprazole (Dexilant)	CYP2C19
lansoprazole (Prevacid)	CYP2C19
omeprazole (Prilosec)	CYP2C19

pantoprazole (Protonix)	CYP2C19
MEDICATION	GENE(S)
metoclopramide (Reglan)	CYP2D6
ondansetron (Zofran)	CYP2D6
Anticoagulant	
warfarin (Coumadin)	CYP2C cluster, CYP2C9, CYP4F2, VKORC1
Antihypertensive	
Metoprolol (Toprol, Lopressor)	CYP2D6
Anti-infective	
efavirenz (Sustiva, Atripla)	CYP2B6
voriconazole (Vfend)	CYP2C19
abacavir (Ziagen)	HLA-B *57:01
Other	
azathioprine (Imuran)	TPMT, NUDT15
capecitabine (Xeloda)	DPYD
clobazam (Onfi, Sympazan)	CYP2C19
deutetrabenazine (Austedo)	CYP2D6
eliglustat (Cardelga)	CYP2D6
fluorouracil (5-FU, Efudex)	DPYD
fosphenytoin (Cerebyx)	CYP2C9
mercaptopurine (Purixan, Purinethol)	TPMT, NUDT15
phenytoin (Dilantin)	CYP2C9
pitolisant (Wakix)	CYP2D6
siponimod (Mayzent)	CYP2C9
tacrolimus (Prograf)	CYP3A5
tetrabenazine (Xenazine)	CYP2D6
thioguanine (Tabloid)	TPMT, NUDT15
valbenazine (Ingrezza)	CYP2D6
Comprehensive PGx Panel (16 genes) LBOR0229 <i>*Requires disease predisposition counseling and consent for additional genes</i>	
atazanavir (Reyataz)	UGT1A1
belinostat (Beleodaq)	UGT1A1
irinotecan (Camptosar, Onivyde)	UGT1A1
rasburicase (Elitek)	G6PD
pegloticase (Krystexxa)	G6PD
dapsone	G6PD
primaquine	G6PD
tafenoquine (Krintafel, Arakoda)	G6PD
methylene blue (ProveyBlue)	G6PD
nitrofurantoin (Macrobid, Macrochantin)	G6PD

References:

Clinical Pharmacogenetics Implementation Consortium (CPIC)
 FDA Table of Pharmacogenetic Associations Sections 1-3
 FDA Table of Pharmacogenomic Biomarkers in Drug Labeling