

RxMatch™ Comprehensive Report

Intermountain Precision Genomics
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This report combines (i) an analysis of the patient's DNA by Intermountain Precision Genomics, identifying relevant genetic variants that are informative for medication efficacy, safety, and dosing, with (ii) an interpretation of the identified DNA variants by Coriell Life Sciences to bring you immediately actionable clinical guidance regarding safer, more effective medications and dosages for the patient. The Medication Report section lists the type of PGx guidance present on FDA-approved drug labels. Medications with no established FDA PGx guidance are provided solely for educational purposes.

Patient: XYTEST, Name
Date of Birth: Jan 01, 1940
Gender: Unknown

Physician: Dr. Example
Practice: Example Health Associates

Specimen type:
Sample ID: RS-20-0000528B-AS

Medication Summary (more alternatives discoverable at GeneDose Live)

Secured URL: <https://app.genedose.com/?token=A77ZT6KXA>

Therapeutic Class	✓ Standard Precautions	⚠️ ⓘ Caution / Info	✖️ Change recommended
Alpha-1 Blockers	Tamsulosin		
Anti-ADHD Agents	Amphetamine Atomoxetine Dexmethylphenidate Dextroamphetamine Guanfacine Lisdexamfetamine Methylphenidate (COMT)	Clonidine Methylphenidate (ADRA2A)	
Antiarrhythmics	Flecainide Propafenone		
Anticholinergic Agents	Fesoterodine Tolterodine		
Anticoagulants		Warfarin	
Anticonvulsants	Brivaracetam Clobazam Phenytoin		
Antidementia Agents	Donepezil		
Antidepressants	Amitriptyline Clomipramine Desipramine Doxepin		


RS-20-0000528B-AS - XYTEST, Name - Reported Jul 14, 2020

The information contained in this report is intended to be interpreted by a licensed physician or other licensed healthcare professional. This report is not intended to take the place of professional medical advice. Decisions regarding use of prescribed medications must be made only after consulting with a licensed physician or other licensed healthcare professional, and should consider each patient's medical history and current treatment regimen. Portions © 2014-2019 Coriell Life Sciences, Inc.

Therapeutic Class	 Standard Precautions	 Caution / Info	 Change recommended
	Duloxetine Mirtazapine Nortriptyline Protriptyline Trazodone Venlafaxine Vortioxetine		
Antidiabetics	Glibenclamide Glimepiride Saxagliptin Tolbutamide		
Antiemetics	Ondansetron		
Antifungals	Ketoconazole Voriconazole		
Antineoplastic Agents	Methotrexate		
Antiplatelet Agents	Clopidogrel Prasugrel Ticagrelor		
Antipsychotics	Aripiprazole Brexpiprazole Clozapine Haloperidol Iloperidone Olanzapine Perphenazine Quetiapine Risperidone Thioridazine	Pimozide	
Anxiolytics	Alprazolam Buspirone Clonazepam Diazepam		
Beta-3 Adrenergic Agonists	Mirabegron		
Beta Blockers	Carvedilol Metoprolol Nebivolol Propranolol Timolol		
Central Monoamine-Depleting Agents		Tetrabenazine	




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Therapeutic Class	 Standard Precautions	 Caution / Info	 Change recommended
Central Nervous System Agents	Dextromethorphan-Quinidine		
Cholinergic Agonists	Cevimeline		
Cholinesterase Inhibitors	Galantamine		
Contraceptives		Estrogen-containing oral contraceptives	
EGFR Inhibitors	Gefitinib		
Endocrine-Metabolic Agents		Eliglustat	
Hypnotics	Eszopiclone		
Immunosuppressants	Azathioprine Cyclosporine Mercaptopurine Sirolimus Thioguanine	Tacrolimus	
Muscle Relaxants	Carisoprodol		
Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)	Celecoxib Diclofenac Flurbiprofen Ibuprofen Meloxicam Piroxicam		
Opioids	Alfentanil Buprenorphine Codeine Fentanyl Hydrocodone Hydromorphone Morphine Oxycodone Sufentanil Tramadol	Fentanyl (OPRM1) Oxycodone (CYP3A5)	
Proton Pump Inhibitors (PPIs)	Dexlansoprazole Esomeprazole Lansoprazole Omeprazole Pantoprazole Rabeprazole		
Selective Serotonin Reuptake Inhibitors	Citalopram Escitalopram	Fluoxetine	



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Therapeutic Class	 Standard Precautions	 Caution / Info	 Change recommended
(SSRIs)	Fluvoxamine Paroxetine Sertraline		
Statins	Atorvastatin Simvastatin		
Vesicular monoamine transporter 2 inhibitor	Deutetrabenazine		
Xanthine Oxidase Inhibitor	Allopurinol		

Legend



-  Typical response is expected
-  Change recommended
-  Consider alternative therapy

















-  Additional information available
-  Response is uncertain













Clinical Evidence Level









-  Strong
-  Moderate
-  Emerging


















Medication Report Details (by therapeutic class)

















Drug	Finding	Recommendation	Concern	Evidence
Alpha-1 Blockers				
Tamsulosin (Flomax) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		













Drug	Finding	Recommendation	Concern	Evidence
Anti-ADHD Agents				
Amphetamine (Adzenys, Evekeo) <i>FDA drug label: Not established for PGx</i>	 COMT(Val158Met): Increased function. Two alleles with increased activity.	Typical response is expected; no additional therapeutic recommendations.		
Atomoxetine (Strattera) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Clonidine (Clonidine, Kapvay) <i>FDA drug label: Not established for PGx</i>	 ADRA2A(C-1291G): G G	Individuals with rs1800544 GG genotype may be at an increased risk of therapeutic failure due to increased metabolic clearance.	Efficacy	
Dexmethylphenidate (Focalin) <i>FDA drug label: Not established for PGx</i>	 COMT(Val158Met): Increased function. Two alleles with increased activity.	Typical response is expected; no additional therapeutic recommendations.		
Dextroamphetamine (Zenzedi, Dexedrine) <i>FDA drug label: Not established for PGx</i>	 COMT(Val158Met): Increased function. Two alleles with increased activity.	Typical response is expected; no additional therapeutic recommendations.		
Guanfacine (Tenex, Intuniv) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Lisdexamfetamine (Vyvanse) <i>FDA drug label: Not established for PGx</i>	 COMT(Val158Met): Increased function. Two alleles with increased activity.	Typical response is expected; no additional therapeutic recommendations.		
Methylphenidate (ADRA2A) (Concerta, Metadate, Ritalin, Ritalin LA, Quillivant, Daytrana, Methylin) <i>FDA drug label: Not established for PGx</i>	 ADRA2A(C-1291G): G G	Individuals with rs1800544 GG genotype may be at an increased risk of therapeutic failure due to increased metabolic clearance.	Efficacy	

















Drug	Finding	Recommendation	Concern	Evidence
Methylphenidate (COMT) (Concerta, Metadate, Ritalin, Ritalin LA, Quillivant, Daytrana, Methylin) <i>FDA drug label: Not established for PGx</i>	 COMT(Val158Met): Increased function. Two alleles with increased activity.	Typical response is expected; no additional therapeutic recommendations.		
Antiarrhythmics				
Flecainide (Tambocor) <i>FDA drug label: Not established for PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Propafenone (Rythmol) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Anticholinergic Agents				
Fesoterodine (Toviaz) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Tolterodine (Detrol) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Anticoagulants				
Warfarin (Coumadin) <i>FDA drug label: Actionable PGx</i>	 Multigenic: VKORC1, CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Individuals with this combination of alleles may benefit from an increased dose of Warfarin. The FDA table recommends a therapeutic dose of 5-7 mg/day.		

















Drug	Finding	Recommendation	Concern	Evidence
Anticonvulsants				
Brivaracetam <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Clobazam (Onfi) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Phenytoin (Dilantin) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Antidementia Agents				
Donepezil (Aricept) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
















Drug	Finding	Recommendation	Concern	Evidence
Antidepressants				
Amitriptyline (Elavil) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Clomipramine (Anafranil) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Desipramine (Norpramin) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Doxepin (Deptran) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Duloxetine (Cymbalta) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Imipramine (Tofranil) <i>FDA drug label: Actionable PGx</i>	 Multigenic: CYP2C19, CYP2D6: CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Multiple results from uncorrelated genes. CYP2C19: Typical response is expected; no additional therapeutic recommendations.; CYP2D6: Typical response is expected; no additional therapeutic recommendations.		
Mirtazapine <i>FDA drug label: Not established for PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Nortriptyline (Pamelor) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Protriptyline (Vivactil) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		











Drug	Finding	Recommendation	Concern	Evidence
Trazodone (Oleptro, Desyrel) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Venlafaxine (Effexor) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Vortioxetine (Brintellix) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Antidiabetics				
Glibenclamide (Glyburide) <i>FDA drug label: Not established for PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Glimepiride <i>FDA drug label: Not established for PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Saxagliptin (Onglyza) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Tolbutamide (Orinase) <i>FDA drug label: Not established for PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Antiemetics				
Ondansetron (Zofran) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		















Drug	Finding	Recommendation	Concern	Evidence
Antifungals				
Ketoconazole (Nizoral) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Voriconazole (Vfend) <i>FDA drug label: Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Antineoplastic Agents				
Methotrexate (Rheumatrex, Trexall) <i>FDA drug label: Not established for PGx</i>	 MTHFR: Normal function. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Antiplatelet Agents				
Clopidogrel <i>FDA drug label: Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Prasugrel <i>FDA drug label: Informative PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Ticagrelor (Brilinta) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		










Drug	Finding	Recommendation	Concern	Evidence
Antipsychotics				
Aripiprazole (Abilify) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Brexpiprazole (Rexulti) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Clozapine <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Haloperidol (Haldol) <i>FDA drug label: Not established for PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Iloperidone <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Olanzapine (Zalasta, Zyprexa) <i>FDA drug label: Not established for PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Perphenazine (Trilafon) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Pimozide (Orap) <i>FDA drug label: Testing required</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected. For children, the drug label recommends an initial dose of 0.05 mg/kg followed by titration to response up to a maximum of 0.2 mg/kg and not to exceed 10 mg/day. In adults the drug label recommends an initial dose of 1 to 2 mg a day in divided doses followed by titration to response up to a maximum of 0.2 mg/kg/day or 10 mg/day.	ADR	













Drug	Finding	Recommendation	Concern	Evidence
Quetiapine (Seroquel) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Risperidone (Risperdal) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Thioridazine <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Anxiolytics				
Alprazolam (Xanax, Niravam) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Buspirone (Buspar) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Clonazepam (Klonopin) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Diazepam <i>FDA drug label: Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Beta-3 Adrenergic Agonists				
Mirabegron (Myrbetriq) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		



















Drug	Finding	Recommendation	Concern	Evidence
Beta Blockers				
Carvedilol (Coreg) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Metoprolol (Lopressor) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Nebivolol (Bystolic) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Propranolol (Inderal) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Timolol (Blocadren) <i>FDA drug label: Not established for PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Central Monoamine-Depleting Agents				
Tetrabenazine (Xenazine) <i>FDA drug label: Testing required</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected. The drug label recommends a maximum daily dose of 100 mg and a maximum single dose of 37.5 mg.		
Central Nervous System Agents				
Dextromethorphan-Quinidine (Nuedexta) <i>FDA drug label: Testing recommended</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Cholinergic Agonists				
Cevimeline (Evoxac) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		







Drug	Finding	Recommendation	Concern	Evidence
Cholinesterase Inhibitors				
Galantamine (Razadyne, Razadyne ER, Nivalin, Lycopremine, Reminyl) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Contraceptives				
Estrogen-containing oral contraceptives <i>FDA drug label: Not established for PGx</i>	 F5: Two Leiden alleles	Consider (family) history prior to prescribing. Positive (family) history of thrombotic events: avoid estrogen-containing OC and select alternative (e.g. copper intrauterine device, progestin-only contraceptive). Negative (family) history of thrombotic events: avoid additional risk factors (e.g. obesity, smoking).	ADR	
EGFR Inhibitors				
Gefitinib (Iressa) <i>FDA drug label: Testing required</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Endocrine-Metabolic Agents				
Eliglustat <i>FDA drug label: Testing required</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected. The drug label recommends a dose of 84 mg twice daily.		
Hypnotics				
Eszopiclone (Lunesta) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		













Drug	Finding	Recommendation	Concern	Evidence
Immunosuppressants				
Azathioprine (Imuran) <i>FDA drug label: Testing recommended</i>	 TPMT: Extensive metabolizer. Two alleles showing normal activity.	Individuals with extensive metabolizer status are expected to have a typical response to thiopurines.		
Cyclosporine (Gengraf, Neoral) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Mercaptopurine (Purinethol) <i>FDA drug label: Testing recommended</i>	 TPMT: Extensive metabolizer. Two alleles showing normal activity.	Individuals with extensive metabolizer status are expected to have a typical response to thiopurines.; no additional therapeutic recommendations.		
Sirolimus (Rapamune) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Tacrolimus (Prograf, Hecoria) <i>FDA drug label: Not established for PGx</i>	 CYP3A5: Two alleles showing little or no activity.	Individuals with poor metabolizer status have higher dose-adjusted trough concentrations of tacrolimus; the resultant increased concentrations may increase the probability of pharmacotherapy success. Consider initiating therapy with the recommended starting dose. In liver transplant patients, donor genotype should be considered as well as the recipient's.		
Thioguanine (6-TG, Tabloid, Lanvis) <i>FDA drug label: Testing recommended</i>	 TPMT: Extensive metabolizer. Two alleles showing normal activity.	Individuals with extensive metabolizer status are expected to have a typical response to thiopurines.		
Muscle Relaxants				
Carisoprodol (Soma) <i>FDA drug label: Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		













Drug	Finding	Recommendation	Concern	Evidence
Non-drug				
ABCG2	 ABCG2: Normal function. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
ADRA2A(C-1291G)	 ADRA2A(C-1291G): G G	Uncertain phenotype		
COMT(Val158Met)	 COMT(Val158Met): Increased function. Two alleles with increased activity.	Increased function. Two alleles with increased activity.		
CYP1A2	 CYP1A2: Extensive metabolizer. Two alleles showing normal activity.	No additional therapeutic recommendations.		
DPYD	 DPYD: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
G6PD	 G6PD: Normal function. Two alleles of Class IV variants which are normal (60-150% activity).	Typical response is expected; no additional therapeutic recommendations.		
GRIK4	 GRIK4: Altered function. Two alleles with altered activity.	Altered function. Two alleles with altered activity.		
HTR2A	 HTR2A: Normal function. Two alleles with normal activity.	Normal function. Two alleles with normal activity.		
OPRM1(A118G)	 OPRM1(A118G): Normal function. Two alleles with normal activity.	Normal function. Two alleles with normal activity.		









Drug	Finding	Recommendation	Concern	Evidence
Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)				
Celecoxib (Celebrex) <i>FDA drug label: Actionable PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Diclofenac (Cataflam) <i>FDA drug label: Not established for PGx</i>	 CYP2C9:rs1057910: Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Flurbiprofen (Ocufen) <i>FDA drug label: Actionable PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Ibuprofen (Motrin, Advil) <i>FDA drug label: Not established for PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Meloxicam (Mobic) <i>FDA drug label: Not established for PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Piroxicam (Feldene) <i>FDA drug label: Actionable PGx</i>	 CYP2C9: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Opioids				
Alfentanil (Rapifen, Alfenta) <i>FDA drug label: Not established for PGx</i>	 OPRM1(A118G): Normal function. Two alleles with normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Buprenorphine (Butrans, Buprenex) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Codeine <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Fentanyl (Duragesic, Sublimaze) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Fentanyl (OPRM1) (Duragesic, Sublimaze) <i>FDA drug label: Not established for PGx</i>	 OPRM1(A118G): Normal function. Two alleles with normal activity.	Individuals with A118G A/A genotype are associated with decreased epidural analgesia satisfaction at standard doses. Consider increasing dose based upon assessment of clinical benefit and tolerability.	Efficacy	
Hydrocodone <i>FDA drug label: Not established for PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Hydromorphone (Dilaudid) <i>FDA drug label: Not established for PGx</i>	 OPRM1(A118G): Normal function. Two alleles with normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Morphine (MS-IR) <i>FDA drug label: Not established for PGx</i>	 OPRM1(A118G): Normal function. Two alleles with normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Oxycodone (Oxycontin) <i>FDA drug label: Not established for PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Oxycodone (CYP3A5) (Oxycontin) <i>FDA drug label: Not established for PGx</i>	 CYP3A5: Two alleles showing little or no activity.	In a preliminary study, individuals with poor metabolizers status have a significantly higher opioid escalation index compared to normal (extensive) metabolizers. Though the impact of metabolizer status at CYP3A5 on pain relief is currently unknown, consider reducing the initial dose. There does not appear to be an effect of this metabolizer status on the incidence of drowsiness.	ADR & Efficacy	
Sufentanil (Sufenta) <i>FDA drug label: Not established for PGx</i>	 OPRM1(A118G): Normal function. Two alleles with normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Tramadol (Ultracet, Ultram) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Proton Pump Inhibitors (PPIs)				
Dexlansoprazole (Dexilant, Kapidex) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Esomeprazole (Nexium) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Lansoprazole (Prevacid) <i>FDA drug label:</i> <i>Informative PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Omeprazole (Prilosec, Zegerid) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Pantoprazole (Protonix) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Rabeprazole (Aciphex) <i>FDA drug label:</i> <i>Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Selective Serotonin Reuptake Inhibitors (SSRIs)				
Citalopram (Celexa) <i>FDA drug label: Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Escitalopram (Lexapro) <i>FDA drug label: Actionable PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Fluoxetine (Prozac) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Individuals taking fluoxetine should be alert to concomitant use of drugs metabolized by CYP2D6. Briefly, fluoxetine is a potent inhibitor of CYP2D6 enzyme pathway. Fluoxetine inhibits the activity of CYP2D6, and may make individuals with normal CYP2D6 metabolic activity resemble a poor metabolizer. Coadministration of fluoxetine with other drugs that are metabolized by CYP2D6, including certain antidepressants (e.g. TCAs), antipsychotics (e.g. phenothiazines and most atypicals), and antiarrhythmics (e.g. propafenone, flecainide, and others) should be approached with caution.	ADR & Efficacy	
Fluvoxamine (Luvox) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Paroxetine (Paxil) <i>FDA drug label: Informative PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Sertraline (Zoloft) <i>FDA drug label: Not established for PGx</i>	 CYP2C19: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		

Drug	Finding	Recommendation	Concern	Evidence
Statins				
Atorvastatin (Lipitor, Caduet) <i>FDA drug label: Not established for PGx</i>	 CYP3A4: Extensive metabolizer. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		
Simvastatin (Zocor) <i>FDA drug label: Informative PGx</i>	 SLCO1B1: Normal liver uptake activity.	Individuals with normal SLCO1B1 liver uptake activity are expected to have a typical response to a standard dose of simvastatin.		
Vesicular monoamine transporter 2 inhibitor				
Deutetrabenazine (Austedo) <i>FDA drug label: Actionable PGx</i>	 CYP2D6: Extensive metabolizer. Two alleles showing normal function.	Typical response is expected; no additional therapeutic recommendations.		
Xanthine Oxidase Inhibitor				
Allopurinol (Zyloprim)	 ABCG2: Normal function. Two alleles showing normal activity.	Typical response is expected; no additional therapeutic recommendations.		

Thrombosis Profile

Tested Genes (Alleles)	Genotype	Predicted Phenotype	Clinical Guidance
Prothrombin (F2)	Normal	Variant alleles detected. It is important for individuals possessing this allelic variant to understand the clinical risks and the genetic implications of their result. Patients should be counseled by their physician or genetic counselor	Individuals homozygous for the Factor V Leiden mutation have an approximately 80-fold increased risk of venous thrombosis as compared to individuals without the mutation.
Factor V Leiden	Homozygous variant		
MTHFR (A1298C)	Normal		
MTHFR (C677T)	Normal		

General Description

Genetic analyses of three genes (four alleles) considered to increase the risk for venous thrombosis were performed using molecular genetic techniques. The presence of the Prothrombin (Factor 2) gene allele 20210A and Factor V Leiden allele 1691A are risk factors for venous thrombosis. This risk may be further increased by the use of estrogen therapy, oral contraceptives, pregnancy, and surgery.

Patients who are homozygous for MTHFR 677T or MTHFR 1298C may have a further increased risk for venous thrombosis if they also possess the Factor V Leiden 1691A allele. However the MTHFR alleles alone do not predict a significant risk for venous thrombosis.

References and Useful Information:

- Factor V Leiden Working Group; ACMG Laboratory Quality Assurance Molecular Subcommittee of the ACMG Laboratory Quality Assurance Committee AMERICAN COLLEGE OF MEDICAL GENETICS; Standards and Guidelines for Clinical Genetics Laboratories; 2006 Edition
 - Middeldorp S, Henkens CM, Koopman MM, van Pampus ECM, Hamulyák K, van der Meer J, Prins MH, Büller HR. The incidence of venous thromboembolism in family members of patients with factor V Leiden mutation and venous thrombosis. *Ann Intern Med* 1998;128:15-20.
 - Vandenbroucke JP, Koster T, Briet E, Reitsma PH, Bertina RM, Rosendaal FR. Increased risk of venous thrombosis in oral contraceptive users who are carriers of factor V Leiden mutation. *Lancet* 1994;344:1453-1457.
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 - De Stefano V, Martinelli I, Mannucci PM, Paciaroni K, Chiusolo P, Casorelli I, Rossi E, Leone G. The risk of recurrent deep venous thrombosis among heterozygous carriers of both factor V Leiden and the G20210A prothrombin mutation. *N Engl J Med* 1999;341:801-806.
- M. Adams, P.D. Smith, D. Martin, J.R. Thompson, D. Lodwick, N.J. Samani. Genetic analysis of thermolabile methylenetetrahydrofolate reductase as a risk factor for myocardial infarction. *QJM*. 1996 Jun;89(6):437-44.

Clinical Evidence Levels

● Strong

- Includes gene-drug pairs approved by the Coriell Institute for Medical Research Pharmacogenomics Advisory Group.
- Includes gene-drug pairs supported by multiple studies documenting consistent effects of specific genetic variant(s) on clinical outcomes.
- Includes gene-drug pairs approved by the Dutch Pharmacogenetics Working Group (DPWG) and/or guidelines published in Clinical Pharmacology and Therapeutics by the Clinical Pharmacogenetics Implementation Consortium (CPIC).

● Moderate

- Includes gene-drug pairs supported by pharmacokinetic, pharmacodynamic, or molecular/cellular functional studies showing consistent effects of genetic variant(s).
- Includes Drug product information (e.g. This interpretation is based on guidance available in the FDA (Food and Drug Administration) drug label for ABILIFY® (10/2013).
- Includes gene-drug pairs for which potential clinical outcomes are inferred from similar gene-drug interactions approved by the Dutch Pharmacogenetics Working Group (DPWG), and/or guidelines published in Clinical Pharmacology and Therapeutics by the Clinical Pharmacogenetics Implementation Consortium (CPIC), and/or pharmacogenomic reports and submission from the Coriell Institute for Medical Research.

○ Emerging

- Includes gene-drug pairs supported by published studies of the drug, related drug, or a probing compound of interest involving limited data and/or inconsistent findings.

Disclaimer: These tests were developed and characterized by Intermountain Precision Genomics. The tests in Intermountain Precision Genomics's pharmacogenetics panel have not been approved by the Food and Drug Administration. The FDA has determined that such approval is not necessary, provided that the laboratory both (1) maintains its good standing as a clinical testing laboratory with all mandatory accrediting bodies, and (2) continually demonstrates that its testing protocols and procedures achieve a high degree of analytical accuracy.

Limitation: This test will not detect all the known alleles that result in altered or inactive tested genes. This test does not account for all individual variations in the individual tested. Absence of a detectable gene mutation does not rule out the possibility that a patient has different phenotypes due to the presence of an undetected polymorphism or due to other factors such as drug-drug interactions, comorbidities and lifestyle habits.

Methodology: Illumina MiSeq System sequencing.

Laboratory Certification: CLIA # 46D2094383

Laboratory Director: Jeremy Wallentine

Genetic Summary

Gene	Result	Activity †
ABCG2	G G	Normal function
ADRA2A(C-1291G)	G G	Multiple statuses; see per-drug detail
COMT(Val158Met)	G G	Multiple statuses; see per-drug detail
CYP1A2	*1A *1A	Extensive metabolizer
CYP2C19	*1 *1	Extensive metabolizer
CYP2C9	*1 *1	Extensive metabolizer
CYP2D6	*2B *2B	Extensive metabolizer
CYP3A4	*1A *1A	Multiple statuses; see per-drug detail
CYP3A5	*3A *3A	Poor metabolizer
DPYD	*1 *1	Normal function
Factor V Leiden	Variant	See Thrombosis Profile
G6PD	B (WT) B (WT)	Normal function
GRIK4	T T	Altered function
HTR2A	A A	Normal function
MTHFR	WT WT	Normal function
MTHFR (A1298C)	Normal	See Thrombosis Profile
MTHFR (C677T)	Normal	See Thrombosis Profile
OPRM1(A118G)	A A	Multiple statuses; see per-drug detail
Prothrombin (F2)	Normal	See Thrombosis Profile
SLCO1B1	*1 *1	Normal liver uptake activity
TPMT	*1 *1	Extensive metabolizer
VKORC1	*1 *1	Normal (with respect to Warfarin)

GeneDose Live

Individualized, additional therapeutic decision support information based on Name XYTEST's genetics, drug regimen, indications, demographics, and lifestyle indicators are available at GeneDose Live via this secured URL: <http://checkdru.gs/>



GeneDose Key: A77ZT6KXA

RS-20-0000528B-AS - XYTEST, Name - Reported Jul 14, 2020

The information contained in this report is intended to be interpreted by a licensed physician or other licensed healthcare professional. This report is not intended to take the place of professional medical advice. Decisions regarding use of prescribed medications must be made only after consulting with a licensed physician or other licensed healthcare professional, and should consider each patient's medical history and current treatment regimen. Portions © 2014-2019 Coriell Life Sciences, Inc.

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Sample ID: RS-20-0000528B-AS

RS-20-0000528B-AS - XYTEST, Name - Reported Jul 14, 2020

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