Patient	**XXX**	Requesting physician	
Date of birth	01/06/1956 | Sex F		

Sample type	DNA	Report generated	29/08/2022
Collection date	10/06/2022	Laboratory director	Dr C. Lapucci
Received date	28/06/2022	Contact email	cristina.lapucci@synlab.it
Sample number	xxx		

MyPGx ® - Pharmacogenetic short screening panel (method: PCR, MassArray and MLPA)

Provided clinical information:

Clinical information	
Known problematic medication	NKDA
Relevant medical history	None

Summary of key pharmacogenetic results (predicted Poor or Ultrarapid activity):

Gene	Prediction
CYP2C19	Rapid metabolizer
VKORC1	Warfarin resistance
SLC22A1	Low function
SLCO1B3	Low function
SULT1A1	Poor metabolizer
NAT2	Poor acetylator

The detailed pharmacogenetic results are presented on the following pages.

Technical comments and limitations:

Coverage 100%. Haplotypes not determined (failed SNPs): None

PGx is a rapidly-evolving field primarily providing evidence-based predictions of how the tested individual's genetic profile may affect reaction to certain drugs. Factors such as drug-drug interaction and also age, diet, ethnicity, family and personal health history, can also impact the likelihood of exhibiting certain drug reactions, independently of genotype-based predictions.

This report is intended for use by a healthcare professional. Based on PGx results, **patients should make no changes to medical care without the prior advice of and consultation with a healthcare professional** [including, but not limited to, changes in dosage or frequency of medication, diet and/or exercise regimens, or pregnancy planning].

ELECTRONIC SIGNATURE	**Dott.ssa Cristina Lapucci** SPECIALISTA IN GENETICA MEDICA SYNLAB ITALIA

GENOTYPE/HAPLOTYPE/PHENOTYPE DETAIL

Gene	Genotype-Haplotype	Allele Tested	Predicted Phenotype
CYP1A1	*1/*1	*1, *2, *3, *4, *5, *6, *7, *8	Normal metabolizer
CYP1A2	*1A/*1F	*1A, *1F, *1K, *7	Normal metabolizer
CYP2A6	*1A/*9	*1A, *1B, *2, *4, *5, *6, *7, *8, *9, *11, *17, *20	Intermediate metabolizer
CYP2B6	*6/*6	*1, *6, *8, *10, *18, *28	Intermediate metabolizer
CYP2C8	*1/*1	*1, *2, *3, *4, *5, *7, *8	Normal metabolizer
CYP2C9	*1/*3	*1, *2, *3, *4, *5, *6, *8, *9, *10, *11, *12, *13, *15, *25, *27	Intermediate metabolizer
CYP2C19	***1A/*17**	***1A, *1B, *2A, *3, *4, *5A, *5B, *6, *7, *8, *12, *17**	**Rapid metabolizer**
CYP2D6	*2A/*41	*1, *2A, *3, *4A, *4M, *5, *6A, *7, *8, *9, *10, *11, *12, *14A, *14B, *17, *18, *19, *20, *21, *36, *38, *40, *41, *42, *44, *56A, *56B, and CNVs	Normal metabolizer
CYP2E1	*1/*7	*1, *2, *7	Normal metabolizer
CYP3A4	*1/*1	*1, *2, *6, *20, *22	Normal metabolizer
CYP3A5	*1A/*1A	*1A, *3A, *3K, *5, *6, *7	Normal metabolizer
VKORC1	**H7/H7**	**H1, H3, H7, H9**	**Warfarin resistance**
SLC15A2	*1/*1	*1, *509K, *284A, *350F, *409S	Normal function
SLC22A1	***420Del/*420Del**	***1, *2, *3, *4, *5, *6, *220V, *283L, *287G, *341L, *408V, *420Del**	**Low function**
SLC22A2	*1/*270A	*1, *54S, *165V, *270A, *400C, *432N	Normal function
SLC22A6	*1/*1	*1, *50H	Normal function
SLCO1B1	*1A/*1A	*1A, *1B, *2, *3, *5, *6, *9, *10, *11, *12, *13, *15	Normal function
SLCO1B3	***233I/*233I**	***1, *112A, *233I**	**Low function**
SLCO2B1	*1/*1	*1, *3	Normal function
ABCB1	*1/*2	*1, *2	Intermediate function
ABCC2	*1/*1324I	*1, *417I, *789F, *768W, *1324I, *1450S	Intermediate function
ABCG2	*1/*1	*1, *141K, *126Ter	Normal function
SULT1A1	***3/*3**	***1, *2, *3, *4**	**Poor metabolizer**
NAT1	*4/*11	*1, *5, *11, *14, *15, *17, *19, *22	Normal acetylator
NAT2	***5B/*6A or *5A/*6C or *6B/*5G or *12C/*5J**	***4, *5A, *5B, *5C, *5D, *5E, *5G, *5J, *6A, *6B, *6C, *6E, *7A, *7B, *11A, *12A, *12B, *12C, *13, *14A, *14B, *14C, *14D, *14E, *14F, *14G, *19**	**Poor acetylator**
TPMT	*1/*1	*1, *2, *3A, *3B, *3C, *4, *8	Normal metabolizer
GSTM1	*1/*1	*1, *173Asn	Normal metabolizer
GSTP1	*1A/*1A	*1A, *1B, *1D, *1C	Normal metabolizer
UGT1A1	*28(*60)/*28(*60)	*1, *6, *7, *27, *29, *60	Intermediate metabolizer
UGT2B7	*1a/*1a	*1a, 2b	Normal metabolizer
UGT2B15	*2/*2	*1, *2	Intermediate metabolizer
DPYD	*1/*2A	*1, *2A, *7, *8, *9A, *9B, *10	Intermediate metabolizer

Disclaimer: Laboratory-developed screening test and interpretation protocols, employing research-use only (RUO) materials. The result of the "Phenotype" shown in the table is to be considered as a generic parameter and not specific to a single drug. For a reference to a specific drug check the tables below in the report. Additional Disclaimer: MyPGx® is a registered trade mark of SYNLAB International GmbH. **Patients should not initiate or modify any treatment or otherwise use the information in this report without the prior advice, consultation and supervision of a licensed healthcare professional such as a pharmacist or medical doctor.**

Methodology: PCR-based RUO assays detect listed alleles, including all common and most rare variants with known clinical significance at analytical sensitivity and specificity >99%. Phenotypic predictions based on the current state of the scientific literature and PharmGKB. MLPA assay to identify CYP2D6 CNVs (deletions, duplications).

Limitations: Testing cannot detect all genetic variants, inactive or altered genes. The absence of a finding of a detectable gene or variant does not necessarily indicate patient possesses intermediate- or high-sensitivity phenotypes or that patient has an undetected variant. Drug-drug interactions may significantly modify phenotypes, especially in polymedicated patients. The lack of data in the literature and the absence of clinical reports do not allow any ambiguous variants and related phenotypic consequences to be adequately characterised. For these reasons, in the absence of this information, the result is given on the basis of haplotype frequencies.

PHARMACOGENOMICS

Genetic Markers Tested for Pharmacogenomics:

Results are arranged by drug response. Each individual report contains six sections, including: Patient's current medication (if any), Medication history, genotype/haplotype/phenotype detail, PGx report, Genomic Test Results, and Patient Information Card. Inclusion of the PGx Report indicates that the tested individual: displays decreased efficacy to the drug (yellow dots), should use the drug as directed (green dots), or exhibits increased toxicity to the drug (orange dots). Inclusion of Genomic Test Results indicates genotype, haplotype, phenotype, or presence of mutation.

Organization of Table:

1. Gene/Locus refers to gene or intergenic region of genetic marker location.

2. Marker refers to the tested marker's unique identifier.

3. Genotype/Haplotype refers to the particular marker's combination of nucleotides. The letter(s) on either side of the slash refer(s) to the two (2) copies of the patient DNA. Del and dashes denotes nucleotide indels in patient DNA. Empty cells indicate an absence of genotyping results.

4. Phenotype refers to the CYP specific drug metabolizing capabilities of an individual.

See RISKS AND LIMITATIONS on the last pages of this Report.

PGx Report - Pain Management

Type: Anti-inflammatory Agent, Analgesic, Antipyretic

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
The Nonsteroidal Antiinflammatory Drugs (NSAIDs)						
Acetic acid derivatives	Diclofenac	UGT2B7	CYP2C9, CYP2E1, CYP3A4		●	
	Nabumetone	CYP1A2	CYP2C19, CYP3A4		●	
	Indomethacin	CYP2C9	CYP2C19			●
Enolic acid (Oxicam) derivatives	Meloxicam	CYP2C9	CYP1A2, CYP3A4, CYP3A5			●
	Piroxicam	CYP2C9	CYP3A4, CYP3A5			●
	Tenoxicam	CYP2C9				●
	Lornoxicam	CYP2C9				●
Selective COX-2 inhibitors (Coxibs)	Etoricoxib	CYP3A4	CYP3A5, CYP2C9, CYP2D6, CYP1A2		●	
	Parecoxib	CYP2C9	CYP3A4, CYP3A5			●
	Celecoxib	CYP2C9	CYP2C19			●
Propionic acid derivatives	Ibuprofen	CYP2C9	CYP2C19, CYP2C8, UGT2B7		●	
	Flurbiprofen	CYP2C9				●
	Ketoprofen	CYP3A4	CYP2C9, CYP3A5, UGT2B7		●	
	Fenoprofen	CYP2C9	UGT2B7			●
	Vicoprofen	CYP2D6	CYP3A4		●	
	Naproxen	CYP2C9	CYP1A2, CYP2C8, UGT2B7, SULT1A1			●
Anthranilic acid derivatives (Fenamates)	Mefenamic acid	CYP2C9				●
The Non-NSAIDs Analgesic	Acetaminophen	UGT1A1, SULT1A1, GSHs	CYP2E1, CYP3A4, CYP3A5, CYP2D6, CYP1A2, ABCG2		●	

PGx Report - Pain Management

Type: Opioid

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Opioid Analgesics						
Opium alkaloids	Morphine	UGT2B7	ABCB1, UGT1A1, COMT		●	
	Codeine	CYP2D6	CYP3A4, UGT2B7, CYP3A5		●	
Ethers of morphine	Dihydrocodeine	CYP3A4	CYP2D6, CYP3A5		●	
	Ethylmorphine	CYP2D6	CYP3A4, CYP3A5		●	
Semi-synthetic alkaloid derivatives	Hydrocodone	CYP2D6	CYP3A4, CYP3A5		●	
	Hydromorphone	UGT2B7			●	
	Oxycodone	CYP3A4	CYP3A5, CYP2D6, ABCB1, UGT2B7, COMT		●	
	Oxymorphone	UGT2B7			●	
Synthetic opioids						
Anilidopiperidine derivatives	Alfentanyl	CYP3A4	CYP3A5, ABCB1		●	
	Fentanyl	CYP3A4	CYP3A5, ABCB1		●	
	Sufentanil	CYP3A4	CYP3A5		●	
Phenylpiperidine derivatives	Meperidine	CYP2B6	CYP3A4, CYP2C19, CYP3A5			●
	Ketobemidone	CYP2C9	CYP3A4, CYP3A5			●
Diphenylpropylamine derivatives	Dextropropoxyphene	CYP3A4	CYP3A5, Renal Excretion		●	
	Levacetylmethadol	CYP3A4	CYP3A5		●	
	Methadone	CYP3A4	CYP2B6, CYP2D6, CYP3A5, ABCB1, UGT2B7, COMT		●	
Oripavine derivatives	Buprenorphine	CYP3A4	CYP3A5, CYP2C8, UGT1A1, UGT2B7		●	
Morphinan derivatives	Dextromethorphan	CYP2D6	CYP3A4, CYP3A5		●	
Others	Tramadol	CYP2D6	CYP3A4, CYP2B6, CYP3A5, SLC22A1, COMT	●		
	Tapentadol	CYP2C9	CYP2C19, CYP2D6		●	
	Tilidine	CYP3A4	CYP2C19, CYP3A5		●	
Anti-opioid	Methylnaltrexone	CYP2D6	CYP3A4, CYP3A5		●	
	Naltrexone	UGT2B7	UGT1A1		●	

PGx Report - Pain Management

Type: Drugs Prescribed for the Treatment of Gout, Antirheumatic

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Drugs Prescribed for Gout						
Uricosurics	Sulfinpyrazone	CYP2C9	CYP3A4, CYP3A5		✓	
Mitotic inhibitors	Colchicine	CYP3A4	CYP3A5		✓	
Xanthine oxidase inhibitors	Febuxostat	CYP1A2, CYP2C8	CYP2C9, UGT1A1, UGT2B7		✓	
	Allopurinol	AOX1	Renal Excretion, HLA-B*5801		✓	
	Oxypurinol	Renal Excretion			✓	
Recombinant urate oxidase	Rasburicase		G6PD, CYB5R1, CYB5R2, CYB5R3, CYB5R4		✓	
Antimetabolites	Azathioprine	XO	TPMT, AOX1		✓	
	Methotrexate	Renal Excretion	AOX1, SLCO1B1, SLC19A1, ABCC1, ABCC2, ABCC3, ABCG2		✓	
DMARDs	Leflunomide	CYP1A2			✓	
Anti-inflammatory	Tofacitinib	CYP3A4	CYP2C19, CYP3A5		✓	
Abbreviations: DMARDs, Disease-modifying antirheumatic drugs; RE, renal excretion (unchanged drug).						

PGx Report - Psychiatry

Type: Antidepressant I

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Antidepressants						
SSRIs	Citalopram	CYP2C19, CYP2D6	CYP3A4, CYP3A5, SLC6A4, HTR2A		✓	
	Escitalopram	CYP3A4, CYP2C19	CYP2D6, CYP3A5, SLC6A4, HTR2C		✓	
	Dapoxetine	CYP2D6	CYP3A4, CYP3A5		✓	
	Fluoxetine	CYP2D6	CYP3A4, CYP2C9, CYP3A5, CYP2C19, SLC6A4, HTR2A		✓	
	Paroxetine	CYP2D6	CYP3A4, CYP1A2, CYP3A5, CYP2C9, SLC6A4, HTR2A, DRD3		✓	
	Sertraline	CYP2B6	CYP2C19, CYP2C9, CYP3A4, CYP2D6, SLC6A4			✓
	Fluvoxamine	CYP2D6	CYP1A2, SLC6A4, HTR2A		✓	
SMSs	Vilazodone	CYP3A4	CYP3A5, CYP2C19, CYP2D6		✓	
SNRIs	Levomilnacipran	CYP3A4	CYP2C8, CYP3A5, CYP2C19, CYP2D6		✓	
	Milnacipran	UGTs	Renal Excretion		✓	
	Venlafaxine	CYP2D6	CYP2C19, CYP3A4, CYP2C9, CYP3A5, SLC6A3, SLC6A4, HTR2A		✓	
	Duloxetine	CYP2D6	CYP1A2, HTR2A		✓	
NRIs	Atomoxetine	CYP2D6	CYP2C19, CYP3A4, CYP3A5, SLC6A2		✓	
	Reboxetine	CYP3A4	CYP3A5		✓	
	Maprotiline	CYP2D6	CYP1A2		✓	
TCAs that preferentially inhibit the reuptake of serotonin	Clomipramine	CYP2D6	CYP3A4, CYP2C19, CYP1A2, CYP2C9, SLC6A4, HTR2A		✓	
	Imipramine	CYP1A2, CYP2D6	CYP2C19, CYP3A4, CYP3A5		✓	
TCAs that preferentially inhibit the reuptake of norepinephrine	Desipramine	CYP2D6	CYP1A2, CYP2C19		✓	
	Nortriptyline	CYP2D6	CYP1A2, CYP2C19, ABCB1, SLC6A4		✓	
	Protriptyline	CYP2D6				✓

PGx Report - Psychiatry

Type: Antidepressant II

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Antidepressants						
TCAs that fairly balanced serotonin-norepinephrine reuptake inhibitors	Amitriptyline	CYP2D6	CYP3A4, CYP2C19, CYP2C9, CYP1A2, CYP2B6		✓	
	Doxepin	CYP2D6, CYP2C19	CYP1A2, CYP3A4, CYP3A5		✓	
	Dosulepin	CYP2D6, CYP2C9	CYP3A4, CYP1A2, CYP3A5, CYP2C19		✓	
TeCAs	Mianserin	CYP2D6	CYP3A4, CYP1A2, CYP2B6, CYP3A5		✓	
	Amoxapine	CYP2D6	CYP3A4, CYP3A5		✓	
TCA with antipsychotic and sedative properties	Trimipramine	CYP2D6	CYP2C19, CYP2C9		✓	
MAOI	Tranylcypromine	MAO	CYP3A4, CYP2A6, CYP3A5, CYP2C19, CYP2D6		✓	
	Moclobemide	**CYP2C19**	CYP2D6, CYP1A2, HTR2A		✓	
Atypical antidepressants						
SMSs	Vortioxetine	CYP2D6	CYP2C9, CYP3A4, CYP3A5, UGTs, CYP2A6, CYP2C8, CYP2C19, CYP2B6			⊘
NaSSAs	Mirtazapine	CYP1A2	CYP2D6, CYP3A4, CYP3A5, SLC6A4, HTR2A		✓	
SARIs	Trazodone	CYP3A4	CYP2D6, CYP3A5		✓	
	Nefazodone	CYP2D6, CYP3A4	CYP3A5		✓	
Antidepressant and smoking cessation aid	Bupropion	CYP2B6	CYP2E1, CYP3A4, CYP2D6, CYP1A2, CYP3A5			⊘
Antidepressant and anti-anxiety	Buspirone	CYP3A4	CYP3A5		✓	

Abbreviations: SSRI, serotonin selective reuptake inhibitor; SMS, Serotonin modulator and stimulator; SNRI, serotonin-norepinephrine reuptake inhibitor; NRI, norepinephrine reuptake inhibitor; TCA, tricyclic antidepressant; TeCA, tetracyclic antidepressant; MAOI, monoamine oxidase inhibitor; NaSSA, noradrenergic and specific serotonergic antidepressant; SARI, serotonin antagonist and reuptake inhibitor.

Additional SNPs of Importance for the Treatment of Depression and Psychosis, and the Treatment of Alcohol and Tobacco Use Disorders

Gene	Marker	Genotype	Drug	Level of Evidence	Results
COMT	rs4680	G/G	Fluvoxamine	3	Schizophrenia patients may have a decreased risk for developing extrapyramidal symptoms
COMT	rs4680	G/G	Venlafaxine	3	Patients with Depressive Disorder may have increased response but patients with Anxiety Disorders may have a decreased response
COMT	rs4680	G/G	Paroxetine	3	Depressive patients may have a decreased response or decreased improvement

PGx Report - Psychiatry

Type: Typical Antipsychotic

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Typical antipsychotic						
Butyrophenones	Bromperidol	CYP3A4	CYP3A5		✓	
	Droperidol	CYP3A4	CYP3A5		✓	
	Haloperidol	UGTs, CYP3A4	CYP1A2, CYP2D6, CYP3A5, SLC6A4, HTR2C		✓	
Phenothiazines with aliphatic side-chain	Chlorpromazine	CYP2D6	CYP1A2, CYP3A4, CYP3A5		✓	
	Levomepromazine	CYP3A4	CYP1A2, CYP3A5		✓	
	Promazine	CYP1A2	CYP3A4, CYP2C19, CYP2C9, CYP3A5		✓	
	Cyamemazine	CYP1A2	CYP3A4, CYP2C9, CYP2C8, CYP3A5		✓	
Phenothiazines with piperazine structure	Fluphenazine	CYP2D6				⊘
	Perphenazine	CYP2D6				⊘
	Prochlorperazine	CYP2D6	CYP3A4, CYP3A5		✓	
	Trifluoperazine	CYP1A2			✓	
Phenothiazines with piperidine structure	Thioridazine	CYP2D6	CYP1A2, CYP3A4, CYP2C19, CYP3A5		✓	
Phenothiazines used as an anti-histamine, sedative, and antiemetic	Promethazine	CYP2D6	SULTs		✓	
Diphenyl-butylpiperidine	Pimozide	CYP3A4, CYP2D6	CYP1A2, CYP3A5		✓	
Thioxanthene derivative	Thiothixene	CYP1A2	CYP3A4, CYP3A5		✓	
	Zuclopenthixol	CYP2D6	CYP3A4, CYP3A5		✓	
Tricyclics	Loxapine	CYP1A2	CYP3A4, CYP2D6, CYP3A5		✓	

PGx Report - Psychiatry

Type: Atypical antipsychotic

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Atypical antipsychotic						
Diazepines, Oxazepines, Thiazepines and Oxepines	Quetiapine	CYP3A4, CYP2D6	CYP3A5, CYP1A2, CYP2C9, CYP2C19, SLC6A4		✓	
	Olanzapine	CYP1A2	CYP2D6		✓	
	Asenapine	CYP1A2	CYP2D6, CYP3A4, CYP3A5		✓	
	Clozapine	CYP1A2, CYP2D6	CYP3A4, CYP2C9, CYP2C19, CYP3A5, CYP2A6, SLC6A3, SLC6A4, SLC1A1, HTR2C, DRD3		✓	
Indole derivatives	Sertindole	CYP2D6	CYP3A4, CYP3A5		✓	
	Ziprasidone	CYP3A4	AOX1, CYP3A5		✓	
	Lurasidone	CYP3A4	CYP3A5		✓	
Benzamides	Sulpiride	Renal Excretion			✓	
	Amisulpride	Renal Excretion			✓	
Other antipsychotics	Aripiprazole	CYP2D6	CYP3A4, CYP3A5, DRD3		✓	
	Risperidone	CYP2D6	CYP3A4, CYP3A5, ABCB1, SLC6A4, SLC1A1, HTR2A, HTR2C, DRD3		✓	
	Iloperidone	CYP2D6	CYP3A4, CYP3A5		✓	
	Paliperidone	CYP2D6	CYP3A4, CYP3A5		✓	
	Zotepine	CYP3A4	CYP1A2, CYP3A5, CYP2D6		✓	

Additional SNPs of Importance for Pain Management

Gene	Marker	Genotype	Drug	Level of Evidence	Results
COMT	rs4680	G/G	Paroxetine	3	Patients may require a higher dose

Additional SNPs of Importance in Treatment that Includes the Use of Antipsychotics and for the Treatment of Autism

Gene	Marker	Genotype	Drug	Level of Evidence	Results
COMT	rs4680	G/G	Haloperidol	3	Schizophrenia patients may have a decreased risk for developing extrapyramidal symptoms

Other genetic and clinical factors may also influence a patient's response to medications

PGx Report - Neurology

Type: Drugs Prescribed for the Treatment of ADHD, Related Drugs

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Anti ADHD Stimulants						
Amphetamine	Dextroamphetamine	Renal Excretion, CYP2D6	DBH, FMO3, GLYAT		✓	
	Levoamphetamine	Renal Excretion, CYP2D6	FMO3		✓	
NDRI	Dexmethylphenidate	CYP2D6	Renal Excretion		✓	
Psychostimulant	Lisdexamfetamine	Hydrolysis	CYP2D6, Renal Excretion		✓	
	Methylphenidate	CYP2D6	Renal Excretion, SLC6A2, SLC6A3, SLC6A4, DRD3			✓
Anti ADHD Non-stimulants						
NERI	Atomoxetine	CYP2D6	CYP2C19, CYP3A4, CYP3A5, SLC6A2		✓	
Central alpha-2 Adrenergic Agonist	Clonidine	CYP2D6	CYP1A2, CYP3A4, CYP3A5		✓	
Antidepressants	Bupropion	CYP2B6	CYP2E1, CYP3A4, CYP2D6, CYP1A2, CYP3A5			✓
	Imipramine	CYP1A2, CYP2D6	CYP2C19, CYP3A4, CYP3A5, UGT1A3, UGT1A4		✓	
	Desipramine	CYP2D6	CYP1A2, CYP2C19		✓	
	Milnacipran	UGTs	Renal Excretion		✓	
	Reboxetine	CYP3A4	CYP3A5		✓	
Wakefulness-promoting agent	Modafinil	Hydrolysis, CYP2D6	CYP1A2, CYP3A4, CYP2B6, CYP3A5		✓	
	Armodafinil	CYP3A4	CYP3A5		✓	
Anti-insomnia						
Melatonin Receptor Agonist	Ramelteon	CYP1A2	CYP2C19, CYP3A4, CYP3A5		✓	

Abbreviations: ADHD, Attention deficit hyperactivity disorder; NERI; norepinephrine reuptake inhibitor, NDRI, norepinephrine-dopamine reuptake inhibitor.

PGx Report - Neurology

Type: Drugs Prescribed for the Treatment of Epilepsy

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Antiepileptic						
Barbiturates	**Phenobarbital**	**CYP2C19**	ABCB1	⊘		
Carbamates	Felbamate	CYP3A4	CYP2E1, CYP3A5		●	
Carboxamides	Carbamazepine	CYP3A4	CYP2C8, CYP2B6, UGT2B7, CYP1A2, CYP3A5, ABCB1, HLA-B*1502, HLA-A*3101, ABCC2		●	
Fatty acids	Tiagabine	CYP3A4	CYP3A5, CYP1A2, CYP2D6, CYP2C19		●	
Fructose derivatives	Topiramate	Renal Excretion	CYPs, UGTs		●	
GABA analogs	Gabapentin	Renal Excretion			●	
	Pregabalin	Renal Excretion			●	
Hydantoin	**Phenytoin**	**CYP2C19**	CYP2C9, CYP3A4, CYP3A5, CYP2D6, ABCB1, EPHX1, HLA-B*1502		●	
	Mephenytoin	**CYP2C19**	CYP2C8, CYP2C9, CYP2B6, CYP1A2, CYP2D6		●	
Oxazolidinediones	Trimethadione	CYP2C9	CYP2E1, CYP3A4, CYP3A5		●	
	Paramethadione	CYP2C9				⊘
Pyrimidinedione	Primidone	CYP2C9	CYP2C19		●	
Pyrrolidines	Brivaracetam	CYP2C19, CYP2C9	CYP3A4, CYP3A5, CYP2C8, CYP2B6		●	
	Levetiracetam	Renal Excretion			●	
	Seletracetam	Renal Excretion			●	
Succinimides	Ethosuximide	CYP3A4	CYP3A5, CYP2E1		●	
Sulfonamides	Zonisamide	CYP3A4	CYP2C19, CYP3A5		●	
Other	Lacosamide	CYP2C9	CY2C19, CYP3A4		●	
	Perampanel	CYP3A4	CYP3A5		●	
Abbreviations: GABA, gamma-aminobutyric acid.						

PGx Report - Neurology

Type: Anxiolytic, Hypnotic, Sedative, Anticonvulsant, Muscle Relaxants

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Anxiolytic, Hypnotic, Sedative, Anticonvulsant, and Muscle Relaxant						
Benzodiazepine Short-acting	Midazolam	CYP3A4	CYP3A5		●	
	Triazolam	CYP3A4	CYP3A5		●	
	Brotizolam	CYP3A4	CYP3A5		●	
Benzodiazepine Intermediate-acting	Alprazolam	CYP3A4	CYP3A5		●	
	Bromazepam	CYP1A2	CYP2D6		●	
	Clobazam	**CYP2C19**	CYP3A4, CYP3A5, CYP2B6		●	
	Flunitrazepam	CYP2C19	CYP2C9, CYP3A4, CYP3A5, NAT2		●	
	Estazolam	CYP3A4	CYP3A5		●	
	Clonazepam	CYP3A4	CYP2C19, CYP3A5, NAT2		●	
	Oxazepam-r	UGT2B7	UGT1A9		●	
	Oxazepam-s	UGT2B15				⊘
	Quazepam	CYP3A4	CYP2C19, CYP3A5		●	
	Lormetazepam	CYP3A4	CYP3A5		●	
	Lorazepam-r	UGT2B7			●	
	Lorazepam-s	UGT2B15				⊘
	Nitrazepam	CYP3A4	CYP3A5, NAT2		●	
	Temazepam	CYP2C19	CYP3A4, CYP3A5, UGT2B7		●	
Benzodiazepine Long-acting	Diazepam	CYP2C19, CYP3A4	CYP3A5, CYP2B6, CYP1A2		●	
	Clorazepate	CYP3A4	CYP3A5		●	
	Chlordiazepoxide	CYP3A4	CYP3A5		●	
	Flurazepam	CYP3A4	CYP3A5		●	
	Nordazepam	CYP3A4	CYP3A5		●	
Nonbenzodiazepine hypnotic	Zolpidem	CYP3A4	CYP3A5, CYP1A2, CYP2D6		●	
	Zaleplon	AOX1, CYP3A4	CYP3A5		●	
	Zopiclone	CYP3A4	CYP2C8, CYP2C9, CYP3A5		●	
	Eszopiclone	CYP3A4	CYP2E1, CYP3A5		●	

PGx Report - Neurology

Type: Drugs Prescribed for the Treatment of Alzheimer's and Parkinson's, Related Drugs

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Anti-Alzheimer disease						
Acetylcholinesterase inhibitor	Tacrine	CYP1A2	CYP2D6		✓	
	Donepezil	CYP2D6	CYP3A4, CYP3A5		✓	
	Galantamine	CYP2D6	CYP3A4, CYP3A5		✓	
NMDA receptor antagonist	Memantine	Renal Excretion	UGTs		✓	
Anti-Parkinson disease & Anti-multiple sclerosis						
Precursor of dopamine	Levodopa	AAAD	COMT, SLC22A1		✓	
Inhibitor of MAO-B	Selegiline	CYP2B6	CYP2C9, CYP3A4, CYP3A5, CYP2A6, FMO3			⊘
	Rasagiline	CYP1A2			✓	
Dopamine receptor agonists	Bromocriptine	CYP3A4	CYP3A5		✓	
	Pramipexole	Renal Excretion	DRD3		✓	
	Ropinirole	CYP1A2	UGTs, Renal Excretion		✓	
Anticholinergics - Antimuscarinics	Diphenhydramine	CYP2D6	CYP3A4, CYP3A5, UGT1A3, UGT1A4		✓	
Anti-hyperkinetic movement	Tetrabenazine	CYP2D6	CYP1A2		✓	
Anti-amyotrophic lateral sclerosis drug	Riluzole	CYP1A2			✓	
Anthracenedione	Mitoxantrone	CYP2E1			✓	
Sphingosine 1-phosphate Receptor Modulator	Siponimod	CYP2C9	CYP3A4, CYP3A5			⊘
Selective blocker of members of voltage-activated K+ channels	Dalfampridine	Renal Excretion	CYP2E1		✓	
Abbreviations: NMDA, N-methyl-D-aspartate; COMT, Catechol-O-methyltransferase.						

Additional SNP of Importance for different Medical Condition and personality

Gene	Marker	Genotype	Results
ABCG2	rs2231142	G/G	Increased risk for Gout

Patient Information Card

An easily portable summary of the report patients can share with their medical professionals. (Please cut along dotted line.)

Pharmacogenomic Test Summary

CYP1A1	*1/*1	Normal metabolizer
CYP1A2	*1A/*1F	Normal metabolizer
CYP2A6	*1A/*9	Intermediate metabolizer
CYP2B6	*6/*6	Intermediate metabolizer
CYP2C8	*1/*1	Normal metabolizer
CYP2C9	*1/*3	Intermediate metabolizer
CYP2C19	***1A/*17**	**Rapid metabolizer**
CYP2D6	*2A/*41	Normal metabolizer
CYP2E1	*1/*7	Normal metabolizer
CYP3A4	*1/*1	Normal metabolizer
CYP3A5	*1A/*1A	Normal metabolizer
VKORC1	**H7/H7**	**Warfarin resistance**
SLC15A2	*1/*1	Normal function
SLC22A1	***420Del/*420Del**	**Low function**
SLC22A2	*1/*270A	Normal function
SLC22A6	*1/*1	Normal function
SLCO1B1	*1A/*1A	Normal function
SLCO1B3	***233I/*233I**	**Low function**
SLCO2B1	*1/*1	Normal function
ABCB1	*1/*2	Intermediate function
ABCC2	*1/*1324I	Intermediate function
ABCG2	*1/*1	Normal function
SULT1A1	***3/*3**	**Poor metabolizer**
NAT1	*4/*11	Normal acetylator
NAT2	***5B/*6A or *5A/*6C or *6B/*5G or *12C/*5J**	**Poor acetylator**
TPMT	*1/*1	Normal metabolizer
GSTM1	*1/*1	Normal metabolizer
GSTP1	*1A/*1A	Normal metabolizer
UGT1A1	*28(*60)/*28(*60)	Intermediate metabolizer
UGT2B7	*1a/*1a	Normal metabolizer
UGT2B15	*2/*2	Intermediate metabolizer
DPYD	*1/*2A	Intermediate metabolizer

For a complete report contact Synlab.com