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 - Internal Medicine

Type: Antiemetic

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Antiemetic						
Antiemetic, 5-HT3 receptor antagonist Indole derivative	Dolasetron	CYP3A4	CYP2D6, CYP3A5		✓	
	Tropisetron	CYP3A4	CYP2D6, CYP3A5		✓	
Antiemetic, 5-HT3 receptor antagonist Isoquinoline derivative	Palonosetron	CYP1A2	CYP2D6, CYP3A4, CYP3A5		✓	
Antiemetic, 5-HT3 receptor antagonist Indazole derivative	Granisetron	CYP3A4	CYP3A5		✓	
Antiemetic, 5-HT3 receptor antagonist	Ondansetron	CYP2B6	CYP1A2, CYP2D6, CYP3A4, ABCB1			✗
Antiemetic, dopamine-receptor antagonist	Domperidone	CYP3A4	CYP3A5		✓	
	Prochlorperazine	CYP2D6	CYP3A4, CYP3A5		✓	
	Metoclopramide	CYP2D6	CYP1A2, CYB5R1, CYB5R2, CYB5R3, CYB5R4		✓	
Antiemetic, NK1 receptor antagonist	Aprepitant	CYP3A4	CYP3A5, CYP1A2, CYP2C19		✓	
Antiemetic, H1 histamine receptor antagonist	Diphenhydramine	CYP2D6	CYP3A4, CYP3A5, UGT1A3, UGT1A4		✓	
	Hydroxyzine	ADHs	CYP3A4, CYP3A5		✓	
	Promethazine	CYP2D6	SULTs		✓	
Cannabinoids	Dronabinol	CYP2C9	CYP2C19, CYP3A4, CYP3A5		✓	
Benzodiazepines	Lorazepam	UGT2B15	UGT2B7		✓	
	Midazolam	CYP3A4	CYP3A5		✓	
Anticholinergics	Scopolamine	CYP3A4	CYP3A5		✓	
Steroids	Dexamethasone	CYP3A4	CYP17A1, CYP3A5		✓	

Abbreviations: 5-HT, Serotonin; NK1, neurokinin 1.

PGx Report - Internal Medicine

Type: Drugs Prescribed for the Treatment of Peptic Ulcers and/or Gastro-Esophageal Reflux Disease

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Histamine H2-receptor antagonists	Ranitidine	Renal Excretion	CYP1A2, CYP2C19, CYP3A4, CYP3A5		✓	
Proton-pump inhibitor	**Omeprazole**	**CYP2C19**	CYP3A4, CYP2C9, CYP3A5		✓	
	Dexlansoprazole	**CYP2C19**	CYP3A4, CYP3A5		✓	
	Esomeprazole	**CYP2C19**	CYP3A4, CYP3A5		✓	
	Lansoprazole	CYP3A4	CYP2C19, CYP3A5		✓	
	Rabeprazole	Non Enz	CYP2C19, CYP3A4, CYP3A5		✓	
	Ilaprazole	CYP3A4	CYP3A5		✓	
	Pantoprazole	**CYP2C19**	CYP3A4, CYP2D6, CYP2C9, CYP3A5		✓	

Abbreviations: Non Enz, non-enzymatic metabolism.

PGx Report - Internal Medicine

Type: Drugs Prescribed for the Treatment of Functional Gastrointestinal Disorders, Obesity

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Drugs for functional gastrointestinal disorders						
Acting on serotonin receptors 5-HT3 antagonists	Alosetron	CYP2C9	CYP3A4, CYP1A2			⊘
	Cilansetron	CYP3A4	CYP2D6, CYP1A2, CYP2C19, CYP3A5		✓	
Acting on serotonin receptors 5-HT4 agonists	Mosapride	CYP3A4	CYP3A5		✓	
	Prucalopride	Renal Excretion	CYP3A4, CYP3A5		✓	
Gastroprokinetic						
Serotonin 5-HT$_4$ receptor agonist	Cisapride	CYP3A4	CYP3A5		✓	
	Cinitapride	CYP3A4	CYP2C8, CYP3A5		✓	
Parasympatho mimetic	Itropride	FMO3			✓	
Dopamine antagonists	Metoclopramide	CYP2D6	CYP1A2, CYB5R1, CYB5R2, CYB5R3, CYB5R4		✓	
	Clebopride	CYP3A4	CYP3A5		✓	
	Domperidone	CYP3A4	CYP3A5		✓	
Antipropulsives						
Opioids	Loperamide	CYP3A4	CYP2C8, CYP3A5		✓	
	Morphine	UGT2B7	ABCB1, UGT1A1, COMT		✓	
Centrally acting anti-obesity drugs						
Stimulant/ Amphetamine/ Appetite suppressant agent	Sibutramine	CYP3A4	CYP3A5		✓	
	Phentermine	Renal Excretion	CYP3A4, CYP3A5		✓	
Anorectic	Lorcaserin	CYP2D6	CYP3A4, CYP3A5		✓	

PGx Report - Infectology

Type: Antibiotics

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Antibacterials: protein synthesis inhibitors 50S						
Amphenicols	Chloramphenicol	CYP2C9	UGT2B7			⊘
Lincosamides	Clindamycin	CYP3A4	CYP3A5		✓	
Antibiotic						
Macrolides	Clarithromycin	CYP3A4	CYP3A5		✓	
	Erythromycin	CYP3A4			✓	
	Telithromycin	CYP3A4	CYP3A5		✓	
Antibacterials: nucleic acid inhibitors						
DHPS inhibitor Short-acting sulfonamides	**Sulfadimidine**	**NAT2**	Renal Excretion			⊘
	Sulfapyridine	**NAT2**	Renal Excretion			⊘
DHPS inhibitor Intermediate-acting sulfonamides	Sulfamethoxazole	Renal Excretion	NAT2, CYP2C9			⊘
Anaerobic DNA inhibitors/ Nitroimidazole	Tinidazole	CYP3A4	CYP3A5		✓	
	Ornidazole	CYP3A4	CYP3A5		✓	
DNA-dependent RNA polymerase inhibitors	Rifampicin	CYP3A4	CYP2C8, CYP3A5, CYP2C19, CYP2A6, RE		✓	
	Rifabutin	CYP3A4	CYP1A2, CYP3A5		✓	
Other drugs against mycobacteria	Dapsone	CYP2E1	NAT2, CYP3A4, CYP2C9, CYP3A5, CYP2D6, G6PD		✓	
	Bedaquiline	CYP3A4	CYP2C8, CYP2C19, CYP3A5		✓	
	Isoniazid	**NAT2**	CYP2E1, Renal Excretion			⊘
	Pyrazinamide	AOX1, XDH	CYP1A2, CYP3A4, CYP3A5, RE		✓	
Abbreviations: DHPS, Dihydropteroate synthase.						

PGx Report - Infectology

Type: Antimalarial, Anthelmintic, Antifungal

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Antimalarial						
Aminoquinolines	Chloroquine	CYP2C8	CYP3A4, CYP3A5, G6PD		✓	
	Hydroxychloroquine	CYP2D6	CYP2C8, CYP3A4, CYP3A5		✓	
	Amodiaquine	CYP2C8			✓	
	Primaquine	CYP2D6	G6PD			⊘
Methanolquinolines	Quinine	CYP3A4, CYP2D6	CYP2C19, CYP3A5, G6PD		✓	
	Mefloquine	CYP3A4	CYP3A5		✓	
Artemisinin and derivatives	Artemisinin	CYP3A4	CYP2B6, CYP3A5		✓	
	Artemether	CYP3A4	CYP3A5		✓	
	Artesunate	CYP2A6				⊘
	Arteether	CYP3A4	CYP2B6, CYP3A5		✓	
Biguanides	**Proguanil**	**CYP2C19**			✓	
Other antimalarials	Halofantrine	CYP3A4	CYP3A5		✓	
	Pentamidine	**CYP2C19**	CYP1A2, CYP2D6		✓	
Anthelmintic						
Benzimidazoles	Albendazole	CYP3A4	CYP1A2, CYP3A5		✓	
Antifungals						
Imidazoles	Ketoconazole	CYP3A4	UGT1A1, CYP26A1		✓	
Triazoles	Itraconazole	CYP3A4			✓	
	Voriconazole	**CYP2C19**	CYP2C9, CYP3A4, CYP3A5		✓	
	Fluconazole	Renal Excretion			✓	
Allylamines	Terbinafine	CYP2C9	CYP1A2, CYP3A4, CYP2C8, CYP2C19		✓	

PGx Report - Infectology

Type: Antiretroviral, Antiviral

Drug Class	Substance	Primary Mechanism Involved	Other Mechanisms Involved	May Have Decreased Efficacy	Used As Directed	May Have Increased Toxicity
Protease inhibitor 1st generation	Lopinavir	CYP3A4	SLCO1B1, CYP3A5, ABCC1, ABCC2		✓	
	Ritonavir	CYP3A4	CYP2D6, CYP3A5, ABCC1		✓	
	Saquinavir	CYP3A4	CYP3A5		✓	
	Indinavir	CYP3A4	CYP2D6, CYP3A5, ABCC4		✓	
	Nelfinavir	**CYP2C19**	CYP3A4, CYP3A5		✓	
	Fosamprenavir	CYP3A4	CYP3A5		✓	
Protease inhibitor 2nd generation	Atazanavir	CYP3A4	CYP3A5, ABCB1		✓	
	Darunavir	CYP3A4	CYP3A5, SLCO3A1		✓	
	Tipranavir	CYP3A4	CYP3A5		✓	
NNRTI 1st generation	Delavirdine	CYP3A4	CYP2D6, CYP3A5		✓	
	Efavirenz	CYP2B6	CYP2A6, ABCB1, SLCO3A1, ABCG2			⊘
NNRTI 2nd generation	Nevirapine	CYP3A4	CYP2B6, CYP3A5, ABCB1, SLCO3A1		✓	
	Etravirine	CYP3A4	CYP2C9, CYP2C19, CYP3A5		✓	
	Rilpivirine	CYP3A4	CYP3A5		✓	
Nucleoside reverse transcriptase inhibitor (NRTI)	Zidovudine	UGT2B7	Renal Excretion, SLCO3A1, ABCC1, ABCC4		✓	
	Abacavir	ADH6	UGT1A1, ADK, HLA-B*5701		✓	
Neuraminidase inhibitors/release phase	Zanamivir	Renal Excretion			✓	
	Peramivir	Renal Excretion			✓	
CCR5 Co-receptor Antagonist	Maraviroc	CYP3A4	CYP3A5		✓	
Hepatitis C Virus NS3/4A Protease Inhibitor	Boceprevir	CYP3A4	IFNL3, CYP3A5		✓	
	Telaprevir	CYP3A4	CYP3A5, IFNL3		✓	
	Paritaprevir	CYP3A4	CYP3A5		✓	
	Simeprevir	CYP3A4	CYP2C8, CYP2C19, CYP3A5, IFNL3		✓	
Other antivirals	**Enfuvirtide**	**CYP2C19**	CYP2E1, CYP1A2		✓	
	Raltegravir	UGT1A1	SLCO1A2			⊘
	Elvitegravir	CYP3A4	CYP3A5		✓	
	Dolutegravir	UGT1A1, CYP3A4	CYP3A5		✓	

Abbreviations: NNRTI, Non-Nucleoside Reverse Transcriptase Inhibitors; CCR5, C-C chemokine receptor type 5.

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