ARUP LABORATORIES
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Client: Example Client ABC123
123 Test Drive
Salt Lake City, UT 84108
UNITED STATES

Physician: Doctor, Example

Patient: Patient, Example

DOB	[redacted]/2000
Gender:	Male
Patient Identifiers:	01234567890ABCD, 012345
Visit Number (FIN):	01234567890ABCD
Collection Date:	00/00/0000 00:00

CYP2D6

ARUP test code 3001513

2D6GENO Specimen	Whole Blood
CYP2D6 Genotype	*1/*2A
CYP2D6 Phenotype	Ultrarapid *
2D6GENO Interpretation	See Note

The following CYP2D6 allele(s) were detected: *1/*2A. More than two copies of these CYP2D6 alleles were detected by copy number analysis. This genotype result predicts the ultrarapid metabolizer phenotype with an activity score estimated at >2.25 of 2.

Recommendation: Guidelines for genotype-based dosing are published by the Clinical Pharmacogenetics Implementation Consortium(CPIC) and can be found at: https://cpicpgx.org/ and https://www.pharmgkb.org/.

This result has been reviewed and approved by [redacted]

BACKGROUND INFORMATION: CYP2D6

Characteristics: The cytochrome P450 (CYP) isozyme 2D6 is involved in the metabolism of many drugs. Variants in the gene that code for CYP2D6 may influence pharmacokinetics of CYP2D6 substrates, and may predict or explain nonstandard dose requirement, therapeutic failure, or adverse reactions.

Inheritance: Autosomal codominant.

Cause: CYP2D6 gene variants and copy number affect enzyme expression or activity function.

Variants Tested:Variants are numbered according to M33388 sequence.

*1: Indicative of no detected targeted variants and an assumption of functional allele.

CYP2D6*2: rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*2A: rs1080985, g.-1584C>G; rs16947, g.2850C>T; rs1135840, g.4180G>C

H=High, L=Low, *=Abnormal, C=Critical

CYP2D6*3: rs35742686, g.2549delA
CYP2D6*4: rs1065852, g.100C>T; rs3892097, g.1846G>A; rs1135840, g.4180G>C
CYP2D6*5: gene deletion
CYP2D6*6: rs5030655, g.1707delT
CYP2D6*7: rs5030867, g.2935A>C
CYP2D6*8: rs5030865, g.1758G>T; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*9: rs5030656, g.2615_2617delAAG
CYP2D6*10: rs1065852, g.100C>T; rs1135840, g.4180G>C
CYP2D6*11: rs1080985, g.-1584C>G; rs201377835, g.883G>C; rs16947, g.2850C>T;
rs1135840, g.4180G>C
CYP2D6*13: a CYP2D7-derived exon 1 conversion
CYP2D6*14: rs5030865, g.1758G>A; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*15: rs774671100, g.137_138insT
CYP2D6*17: rs28371706, g.1023C>T; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*29: rs59421388, g.3183G>A; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*31: rs267608319, g.4042G>A; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*35: rs769258, g.31G>A; rs1080985, g.-1584C>G; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*36: a CYP2D6*10 carrying a CYP2D7-derived exon 9 conversion
CYP2D6*36-*10: a CYP2D6*36 and a CYP2D6*10 in tandem
CYP2D6*40: rs28371706, g.1023C>T; rs72549356, g.1863_1864insTTTCGCCCCTTTCGCCCC; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*41: rs28371725, g.2988G>A; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*42: rs72549346, g.3260_3261insTG; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*49: rs1135822, g.1611T>A; rs1065852, g.100C>T; rs1135840, g.4180G>C
CYP2D6*56: rs72549347, g.3201C>T; rs1135840, g.4180G>C
CYP2D6*59: rs79292917, g.2939G>A; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*69: rs28371725, g.2988G>A; rs1065852, g.100C>T; rs16947, g.2850C>T; rs1135840, g.4180G>C
CYP2D6*114: rs5030865, g.1758G>A; rs1065852, g.100C>T; rs16947, g.2850C>T; rs1135840, g.4180G>C
DUP: complete gene duplications

Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring. Sequencing is only performed if needed to characterize a duplicated CYP2D6 gene.

Analytical Sensitivity and Specificity: Greater than 99 percent.

Limitations: Only the targeted CYP2D6 variants will be detected by this panel, and assumptions about phase and content are made to assign alleles. Publicly available sources such as the www.pharmvar.org or www.pharmgkb.org provide guidance on phenotype predictions and allele frequencies. A combination of the *5 (gene deletion) and a gene duplication cannot be specifically identified. This combination is not expected to adversely affect the phenotype prediction. The assay used to detect *40 allele cannot distinguish between insertions of 1 or 2 copies; it also cannot distinguish between heterozygous and homozygous mutant samples due to unavoidable cross reactivity with the wild-type sequence. Additional assays will be used to help differentiate the *40 allele from other CYP2D6 star alleles. Diagnostic errors can occur due to rare sequence variations. Risk of therapeutic failure or adverse reactions with CYP2D6 substrates may be affected by genetic and nongenetic factors that are not detected by this test. This result does not replace the need for therapeutic drug or clinical monitoring.

Please note the information contained in this report does not

contain medication recommendations, and should not be interpreted as recommending any specific medications. Any dosage adjustments or other changes to medications should be evaluated in consultation with a medical provider.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. This test was performed in a CLIA-certified laboratory and is intended for clinical purposes.

Counseling and informed consent are recommended for genetic testing. Consent forms are available online.

EER CYP2D6

See Note

Authorized individuals can access the ARUP Enhanced Report with an ARUP Connect account using the following link.

Your local lab can assist you in obtaining the patient report if you don't have a Connect account.

[redacted]

VERIFIED/REPORTED DATES

Procedure	Accession	Collected	Received	Verified/Reported
2D6GENO Specimen	25-282-152332	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
CYP2D6 Genotype	25-282-152332	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
CYP2D6 Phenotype	25-282-152332	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
2D6GENO Interpretation	25-282-152332	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
EER CYP2D6	25-282-152332	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00

END OF CHART

H=High, L=Low, *=Abnormal, C=Critical