

ORDER NAME

DPYD Genotyping (EPIC Order Code= LAB100651)

- If EPIC is not an option, a paper requisition can be found on the “Clinical Genomics Requisition and Consent forms” page of the website. Complete and submit paper requisition to Genomicslab@upmc.edu.

BACKGROUND

This test identifies the *DPYD* variants and haplotypes to assess the patient's predicted dihydropyrimidine dehydrogenase (DPD) enzyme activity, which informs the expected metabolism of fluoropyrimidine drugs. The reportable *DPYD* variants and haplotypes included in this test are listed in the table below.

DPYD Reportable Variants and Haplotypes					
Allele Name (NM_000110.4)	AMP Tier	dbSNP	Activity Score	CPIC Function	CPIC Evidence
Reference			1	Normal function	
c.1905+1G>A (*2A)	1	rs3918290	0	No function	Strong
c.1679T>G (*13)	1	rs55886062	0	No function	Moderate
c.1129-5923C>G	1	rs75017182	0.5	Decreased function	Strong
c.1129-5923C>G, c.1236G>A (HapB3)	1	rs75017182, rs56038477	0.5	Decreased function	Strong
c.557A>G	1	rs115232898	0.5	Decreased function	Moderate
c.868A>G	1	rs146356975	0.5	Decreased function	Limited
c.2279C>T	1	rs112766203	0.5	Decreased function	Limited
c.2846A>T	1	rs67376798	0.5	Decreased function	Strong
c.299_302del (*7)	2	rs72549309	0	No function	Moderate
c.703C>T (*8)	2	rs1801266	0	No function	Moderate
c.1314T>G	2	rs186169810	0.5	Decreased function	Limited
c.1475C>T	2	rs72549304	0	No function	Limited
c.1774C>T	2	rs59086055	0	No function	Limited
c.2639G>T	2	rs55674432	0	No function	Limited
c.61C>T	MOI	rs72549310	0	No function	Limited
c.1024G>A	MOI	rs183385770	0	No function	Limited

MOI: Marker of Interest

CPIC: Clinical Pharmacogenetics Implementation Consortium

INDICATION FOR TESTING

Fluoropyrimidine (i.e. 5-fluorouracil and capecitabine) is a fundamental part of chemotherapy regimens to treat numerous cancer types. Genetic testing to identify those with DPD deficiency can help mitigate the risk of severe and life-threatening fluoropyrimidine-induced toxicities.

TEST METHODOLOGY

Genomic DNA extracted from the specimen was subjected to polymerase chain reaction (PCR)-based amplification of targeted regions of the *DPYD* gene. Primer extension products were analyzed using matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry, and genotypes were assigned accordingly. A total of 15 clinically relevant *DPYD* variants were assessed (refer to variant table). The corresponding predicted phenotype was assigned based on the current Clinical Pharmacogenetics Implementation Consortium guideline (CPIC Guideline for *DPYD* and Fluoropyrimidines, last accessed March 2026).

TEST LIMITATIONS

This test detects only the *DPYD* variants and specified haplotypes. It does not detect other *DPYD* sequence variants beyond the targeted variants including large deletions, duplications, or rearrangements in the *DPYD* gene. While this test is highly accurate, infrequent errors including rare variations in the regions analyzed, sample contamination, or other causes, may lead to false positive or false negative results. In addition to genotype, the metabolism of drugs may be influenced by other factors, including environmental exposures, dietary and other medications; these and other factors should be considered prior to initiating therapy. All results must be interpreted in the context of other laboratory findings and clinical information.

This test is not designed to provide specific dosing or drug selection recommendations and should be used as an adjunct to clinical decision-making only. Drug label guidance should be followed when dosing patients with medications regardless of the predicted phenotype or activity score.

The assigned phenotype reflects the laboratory's current interpretation at the time this report was issued. The interpretation may change as new scientific evidence becomes available. The most up-to-date phenotype information may be found on the CPIC (Clinical Pharmacogenetics Implementation Consortium) and/or ClinPGx website.

SPECIMEN REQUIREMENTS

- Whole blood-EDTA tube required, 3-5 ml
- Saliva provided in Oragene (OGD-500) collection kits
- Previously extracted DNA from blood or saliva: concentration >5 ng/μl, A260/280 between 1.70-2.0, in a minimum volume of 30 μl

TURNAROUND TIME

7 days from sample receipt

CPT CODE

81232