Proactive Health Plus MEDICATION RESPONSE™

TEST CODE: PR3009

Overview

MyOme Proactive Health Plus Medication Response report uses a PCR-free whole-genome backbone that allows identification of a range of variant types. Whole-genome sequencing (WGS) allows MyOme to re-query a patient's genome as healthcare needs change and new information about the genome is discovered.

Clinical Use

This test is intended to facilitate the use of pharmacogenomic guidance in a general care setting. MyOme reports variants and star alleles in 15 pharmacogenes that are known to impact an individual's response to medication. The results of this test should be interpreted by a trained healthcare provider based on the full context of a patient's medical situation.

Method

Genomic DNA obtained from submitted samples was sequenced using Illumina technology. Reads were aligned to the human genome reference assembly. MyOme's Medication Response variant calling pipeline is used to call variants, star alleles, copy number variants, and assign pharmacogenomic diplotypes.

Sample Types

- Blood (2 EDTA tubes)
- Saliva (2 tubes)
- Buccal (2 swabs)

Turnaround Times

- From sample received, most results are delivered in 5-6 weeks.*
- Follow-up testing or re-requisitions are typically completed in under 2 weeks, often within just a few days.

Included

- Analysis of key pharmacogenes with known pharmacogenomic implications for more than 70 drugs, including antidepressants, statins and opioids
- All Tier 1 variant alleles recommended by the Association for Molecular Pathology (AMP) PGx Working Group for *CYP2C19*[1], *CYP2C9*[2], *CYP2D6*[3], *TPMT* and *NUDT15*[4]
- All Tier 2 variant alleles recommended by the AMP PGx Working Group for *CYP2C19*[1], *CYP2C9*[2], *CYP2D6* (excluding hybridizations)[3]
- Independent healthcare provider review of analysis to make any potential drug recommendations based on gene-drug interactions outlined in the Clinical Pharmacogenetics Implementation Consortium (CPIC)[5] guidelines and FDA Table of Pharmacogenomic Associations[6]
- 15 genes analyzed: ***CYP2B6***: **4; *6; *9; *18; *22,* ***CYP2C9***: **2; *3; *4; *5; *6; *8; *11; *12; *13; *15; *16; *26; *28; *29; *30; *31; *42; *55,* ***CYP2C19:*** **2; *3; *4; *5; *6; *7; *8; *9; *10; *17; *35,* ***CYP2D6:*** **2; *3; *4; *5; *6; *7; *8; *9; *10; *11; *12; *14; *15; *17; *21; *29; *31; *40; *41; *42; *49; *56; *59; *100; *114;* gene duplications and deletions, ***CYP3A4:*** **22,* ***CYP3A5:*** **3; *6; *7,* ***CYP4F2:*** **3,* ***DPYD:*** *rs3918290; rs55886062; rs59086055; rs67376798; rs75017182+rs56038477; rs112766203; rs115232898; rs146356975; rs183385770 F5: rs6025,* ***IFNL3:*** *rs12979860,* ***NUDT15:*** **3; *4; *9,* ***SLCO1B1:*** **5; *9; *14; *20,* ***TPMT:*** **2; *3A; *3B; *3C; *4; *11; *29,* ***UGT1A1:*** **6; *27,* ***VKORC1:*** *rs9923231*

Test Performance[7]

- >98.5% per gene accuracy for diplotypes and phenotypes
- >99% sensitivity for CYP2D6 gene duplications and deletions
- >99% sensitivity for pharmacogenomic SNVs and indels
- >99.5% of pharmacogenomic variants at ≥10x depth 30x average genome-wide coverage

*Turnaround times are provided as estimates and begin once sample(s) are processed at MyOme. Turnaround times may be extended in cases outside of MyOme's control, including delays related to confirmation testing or other unforseen circumstances.

1. Pratt VM et al. Recommendations for Clinical CYP2C19 Genotyping Allele Selection: A Report of the Association for Molecular Pathology. J Mol Diagn. 2018 May;20(3):269-276. doi: 10.1016/j.jmoldx.2018.01.011. **2.** Pratt VM et al. Recommendations for Clinical CYP2C9 Genotyping Allele Selection. J Mol Diagn. 2019 Sep;21(5):746-755. doi: 10.1016/j.jmoldx.2019.04.003. **3.** Pratt VM et al. Recommendations for Clinical CYP2D6 Genotyping Allele Selection. J Mol Diagn. 2021 Sep;23(9):1047-1064. doi: 10.1016/j.jmoldx.2021.05.013. **4.** Pratt VM et al. TPMT and NUDT15 Genotyping Recommendations. J Mol Diagn. 2022 Oct;24(10):1051-1063. doi: 10.1016/j.jmoldx.2022.06.007. **5.** CPIC. Genes-Drugs. Web. cpicpgx.org/genes-drugs. Accessed 2024 Dec. **6.** US Food & Drug Administration. Table of Pharmacogenetic Associations. 2022 Oct. Web. Accessed 2024 Dec. **7.** MyOme Inc, Data on File

DRUG-GENE IMPACT

The list of drugs below can lead to a major or moderate drug-gene interaction based on guidelines described above.[5,6]

Behavioral Health	
Drug Name	**Gene(s)**
amitriptyline	*CYP2D6, CYP2C19*
amoxapine	*CYP2D6*
amphetamine	*CYP2D6*
aripiprazole	*CYP2D6*
aripiprazole lauroxil	*CYP2D6*
atomoxetine	*CYP2D6*
brexpiprazole	*CYP2D6*
citalopram	*CYP2C19, CYP2D6*
clobazam	*CYP2C19*
clomipramine	*CYP2D6*
clozapine	*CYP2D6*
desipramine	*CYP2D6*
diazepam	*CYP2C19*
doxepin	*CYP2D6, CYP2C19*
duloxetine	*CYP2D6*
escitalopram	*CYP2C19*
fluoxetine	*CYP2D6*
fluvoxamine	*CYP2D6*
iloperidone	*CYP2D6*
imipramine	*CYP2D6*
lofexidine	*CYP2D6*
nortriptyline	*CYP2D6*
paroxetine	*CYP2D6*
perphenazine	*CYP2D6*
protriptyline	*CYP2D6*
sertraline	*CYP2C19*
thioridazine	*CYP2D6*
trimipramine	*CYP2D6, CYP2C19*
valbenazine	*CYP2D6*
venlafaxine	*CYP2D6*
vortioxetine	*CYP2D6*

Urology	
Drug Name	**Gene(s)**
darifenacin	*CYP2D6*
fesoterodine	*CYP2D6*
mirabegron	*CYP2D6*
tamsulosin	*CYP2D6*
tolterodine	*CYP2D6*

Reproductive and Sexual Health	
Drug Name	**Gene(s)**
flibanserin	*CYP2C19, CYP2C9, CYP2D6*

Gastroenterology	
Drug Name	**Gene(s)**
dexlansoprazole	*CYP2C19*
dronabinol	*CYP2C9*
esomeprazole	*CYP2C19*
lansoprazole	*CYP2C19*
metoclopramide	*CYP2D6*
nateglinide	*CYP2C9*
omeprazole	*CYP2C19*
ondansetron	*CYP2D6*
pantoprazole	*CYP2C19*
rabeprazole	*CYP2C19*

Infectious Disease	
Drug Name	**Gene(s)**
atazanavir	*UGT1A1*
dolutegravir	*UGT1A1*
efavirenz	*CYP2B6*
peginterferon alfa-2a	*IFNL3*
peginterferon alfa-2b	*IFNL3*
quinine	*CYP2D6*
voriconazole	*CYP2C19*

Cardiology	
Drug Name	**Gene(s)**
atorvastatin	*SLCO1B1*
carvedilol	*CYP2D6*
clopidogrel	*CYP2C19*
fluvastatin	*CYP2C9, SLCO1B1*
lovastatin	*SLCO1B1*
mavacamten	*CYP2C19*
pitavastatin	*SLCO1B1*
pravastatin	*SLCO1B1*
rosuvastatin	*SLCO1B1*
simvastatin	*SLCO1B1*
warfarin	*CYP2C9, CYP4F2, VKORC1*

Miscellaneous	
Drug Name	**Gene(s)**
abrocitinib	*CYP2C19*
cevimeline	*CYP2D6*
eliglustat	*CYP2D6*
lesinurad	*CYP2C9*
meclizine	*CYP2D6*
tropisetron	*CYP2D6*

Neurology	
Drug Name	**Gene(s)**
brivaracetam	*CYP2C19*
deutetrabenazine	*CYP2D6*
donepezil	*CYP2D6*
fosphenytoin	*CYP2C9*
modafinil	*CYP2D6*
phenytoin	*CYP2C9*
pimozide	*CYP2D6*
pitolisant	*CYP2D6*
siponimod	*CYP2C9*
tetrabenazine	*CYP2D6*
valbenazine	*CYP2D6*

Pain Management	
Drug Name	**Gene(s)**
carisoprodol	*CYP2C19*
celecoxib	*CYP2C9*
codeine	*CYP2D6*
elagolix	*SLCO1B1*
flurbiprofen	*CYP2C9*
ibuprofen	*CYP2C9*
lornoxicam	*CYP2C9*
meloxicam	*CYP2C9*
oliceridine	*CYP2D6*
piroxicam	*CYP2C9*
tenoxicam	*CYP2C9*
tramadol	*CYP2D6*

Hematology/Oncology	
Drug Name	**Gene(s)**
capecitabine	*DPYD*
erdafitinib	*CYP2C9*
eltrombopag	*F5*
fluorouracil	*DPYD*
gefitinib	*CYP2D6*
mercaptopurine	*TPMT, NUDT15*
tamoxifen	*CYP2D6*
thioguanine	*TPMT, NUDT15*

Transplant	
Drug Name	**Gene(s)**
azathioprine	*TPMT, NUDT15*
tacrolimus	*CYP3A5*

5. CPIC. Genes-Drugs. Web. cpicpgx.org/genes-drugs. Accessed 2024 Dec. **6.** US Food & Drug Administration. Table of Pharmacogenetic Associations. 2022 Oct. Web. Accessed 2024 Dec. **7.** MyOme Inc, Data on File