MAYO CLINIC
Mayo Medical Laboratories

LABORATORY SERVICE REPORT

1-800-533-1710

PATIENT NAME	PATIENT NUMBER	AGE	SEX	ACCESSION #
PAM, TESTING2C19R	L3MRNW3787520	57	F	W3787520

ORDERING PHYSICIAN	CLIENT ORDER #	ACCOUNT #
		LIAISONS

COLLECTION DATE TIME	RECEIVED DATE TIME	REPORT PRINTED DATE TIME	SPECIMEN INFORMATION
06/10/10 03:07 P		06/24/10 09:53 A	DATE OF BIRTH:

Test Client
Attn: Mayo Liaisons
200 First Street SW
Rochester, MN 55905
507-284-8202

TEST REQUESTED	HI LO	REF RANGE	PERFORM SITE *
CYP2C19 Sequence Genotype			
Sequencing	**Performed**		**MCR**
2C19 Interpretation			**MCR**

This individual has two copies of the gene that produce inactive enzyme. This genotype is associated with the poor metabolizer phenotype. Significant caution should be exercised when treating with drugs metabolized by CYP2C19 and consideration given to using drugs not metabolized by CYP2C19.

2C19 Genotype Star Alleles	**2/3**		**MCR**
2C19 -806C>T (*17)	**C/C**		**MCR**
2C19 1A>G (*4)	**A/A**		**MCR**
2C19 358T>C (*8)	**T/T**		**MCR**
2C19 395G>A (*6)	**G/G**		**MCR**
2C19 636G>A (*3)	**G/A**		**MCR**
2C19 681G>A (*2)	**G/A**		**MCR**
2C19 IVS5+2T>A (*7)	**T/T**		**MCR**
2C19 Reviewed by	**John L. Black, M.D.**		**MCR**

This test was developed and its performance characteristics determined by Laboratory Medicine and Pathology, Mayo Clinic, Rochester MN. It has not been cleared or approved by the U.S. Food and Drug Administration.
A combination of bidirectional and dual monodirectional DNA sequence analysis was used to test for the presence of variants in the promoter as well as exons 1, 3, 4, and 5 of the CYP2C19 gene. These sequencing reactions detect the presence of -806C>T (*17), 1A>G (*4), 358T>C (*8), 395G>A (*6), 636G>A (*3), 681G>A (*2), and IVS5+2T>A (*7). This sequencing assay will not detect all the known mutations that result in decreased or inactive CYP2C19. Absence of a detectable gene mutation or polymorphism does not rule out

** Perform Site Legend on last page of report*

PATIENT NAME	ORDER STATUS	COLLECTION DATE AND TIME
PAM, TESTING2C19R	Final	06/10/10 03:07 P

PATIENT NAME	PATIENT NUMBER	AGE	SEX	ACCESSION #
PAM, TESTING2C19R	L3MRNW3787520	57	F	W3787520

ORDERING PHYSICIAN	CLIENT ORDER #	ACCOUNT #
		LIAISONS

COLLECTION DATE TIME	RECEIVED DATE TIME	REPORT PRINTED DATE TIME	SPECIMEN INFORMATION
06/10/10 03:07 P		06/24/10 09:53 A	DATE OF BIRTH:

Test Client
Attn: Mayo Liaisons
200 First Street SW
Rochester, MN 55905
507-284-8202

TEST REQUESTED	HI LO	REF RANGE	PERFORM SITE *

the possibility that a patient has an intermediate or poor metabolizer phenotype.
Individuals receiving clopidogrel who have one copy (heterozygous) of the null or deficient CYP2C19 polymorphisms detected by this test will likely require a dose increase to achieve effective inhibition of platelet aggregation. Individuals who have two defective copies of these CYP2C19 deficient alleles (poor metabolizers) may not achieve effective inhibition of platelet aggregation using the standard doses of clopidogrel. An increased dose of clopidogrel, or switching to other antiplatelet drugs such as prasugrel, should be considered for CYP2C19 poor metabolizers.
The presence of the *17 promoter polymorphism will increase the expression of the CYP2C19 enzyme encoded by the allele on which it is found. When found in combination with other polymorphisms, we are unable to ascertain the mode of inheritance to predict which allele includes the *17 promoter polymorphism but will make our best prediction of the impact of the findings.
Patients with an extensive (normal) or intermediate metabolizer genotype may have CYP2C19 enzyme activity inhibited by a variety of medications or their metabolites.
The following is a partial listing of drugs known to affect CYP2C19 activity as of the date of this report.
Drugs that undergo metabolism by CYP2C19:
- Anticoagulants: clopidogrel
- Anticonvulsants: mephenytoin, phenytoin, primidone
- Antidepressants: amitriptyline, citalopram, S-citalopram, clomipramine
- Antineoplastic drugs: cyclophosphamide
- Antiretroviral: nelfinavir
- Proton pump inhibitors: lansoprazole, omeprazole, pantoprazole
- Miscellaneous drugs: diazepam, progesterone, propranolol,

** Perform Site Legend on last page of report*

PATIENT NAME	PATIENT NUMBER	AGE	SEX	ACCESSION #
PAM, TESTING2C19R	L3MRNW3787520	57	F	W3787520

ORDERING PHYSICIAN	CLIENT ORDER #	ACCOUNT #
		LIAISONS

COLLECTION DATE TIME	RECEIVED DATE TIME	REPORT PRINTED DATE TIME	SPECIMEN INFORMATION
06/10/10 03:07 P		06/24/10 09:53 A	DATE OF BIRTH:

Test Client
Attn: Mayo Liaisons
200 First Street SW
Rochester, MN 55905
507-284-8202

TEST REQUESTED	HI LO	REF RANGE	PERFORM SITE *

R-warfarin (less active isomer), proguanil
Coadministration may decrease the rate of elimination of other drugs metabolized by CYP2C19.
Drugs known to increase CYP2C19 activity:
carbamazepine
prednisone
rifampin
Coadministration of these drugs increases synthesis of CYP2C19 and increases the rate of elimination of drugs metabolized by CYP2C19.
Drugs known to decrease CYP2C19 activity:
chloramphenicol
cimetidine
felbamate
fluoxetine
fluvoxamine
indomethacin
ketoconazole
lansoprazole
modafinil
omeprazole
probenicid
ticlopidine
topiramate
Coadministration will decrease the rate of metabolism of CYP2C19 metabolized drugs, increasing the possibility of toxicity, particularly in heterozygous individuals.

Rapid DNA Extraction

Comment	**Genomic DNA was extracted.**	**MCR**

** Perform Site Legend on last page of report*

PATIENT NAME	ORDER STATUS	COLLECTION DATE AND TIME
PAM, TESTING2C19R	Final	06/10/10 03:07 P

MAYO CLINIC
Mayo Medical Laboratories

LABORATORY SERVICE REPORT

1-800-533-1710

PATIENT NAME	PATIENT NUMBER	AGE	SEX	ACCESSION #
PAM, TESTING2C19R	L3MRNW3787520	57	F	W3787520

ORDERING PHYSICIAN	CLIENT ORDER #	ACCOUNT #
		LIAISONS

COLLECTION DATE TIME	RECEIVED DATE TIME	REPORT PRINTED DATE TIME	SPECIMEN INFORMATION
06/10/10 03:07 P	06/10/10 03:07 P	06/24/10 09:53 A	DATE OF BIRTH:

Test Client
Attn: Mayo Liaisons
200 First Street SW
Rochester, MN 55905
507-284-8202

TEST REQUESTED	HI LO	REF RANGE	PERFORM SITE *

* PERFORMING SITE

MCR	Mayo Clinic Dpt of Lab Med & Pathology 200 First Street SW Rochester, MN 55905	Lab Director: Franklin R. Cockerill, III, M.D.

PATIENT NAME	ORDER STATUS	COLLECTION DATE AND TIME
PAM, TESTING2C19R	Final	06/10/10 03:07 P

Specimen receipt and report times are in CST/CDT

REPRINT