Test Definition: MATCC

Maternal Cell Contamination, Molecular Analysis, Varies

Overview

Useful For

Ruling out the presence of maternal cell contamination within a fetal specimen

Required for all prenatal testing performed in Mayo Clinic Laboratories' Molecular and Biochemical Genetics laboratories

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
CULFB	Fibroblast Culture for Genetic Test	Yes	No
CULAF	Amniotic Fluid Culture/Genetic Test	Yes	No
_STR1	Comp Analysis using STR (Bill only)	No, (Bill only)	No
_STR2	Add'l comp analysis w/STR (Bill Only)	No, (Bill only)	No

Genetics Test Information

Required in conjunction with molecular and biochemical prenatal testing only.

Testing Algorithm

Prenatal specimens:

If an amniotic fluid specimen (nonconfluent cultured cells) is received, amniotic fluid culture will be performed at an additional charge.

If a chorionic villi specimen (nonconfluent cultured cells) is received, a fibroblast culture will be performed at an additional charge.

To complete this testing, both maternal and proband/fetal samples must be received, and testing must be ordered under separate order numbers. If proband and maternal samples are received under the same order number, a new test order will be added for the maternal sample, per laboratory protocol.

If this test is ordered in conjunction with CMAP / Chromosomal Microarray, Prenatal, Amniotic Fluid/Chorionic Villus Sampling or CMAPC / Chromosomal Microarray, Autopsy, Products of Conception, or Stillbirth, and no other molecular testing is ordered, the test will be changed to PPAP / Parental Sample Prep for Prenatal Microarray Testing, Blood. If both CMAP / Chromosomal Microarray, Prenatal, Amniotic Fluid/Chorionic Villus Sampling or CMAPC / Chromosomal Microarray, Autopsy, Products of Conception, or Stillbirth, and other molecular testing is ordered, PPAP will be added, per laboratory protocol.

Special Instructions

- Informed Consent for Genetic Testing
- Informed Consent for Genetic Testing (Spanish)
- Molecular Genetics: Prenatal Patient Information

Method Name
Polymerase Chain Reaction (PCR) based comparison of Microsatellite Markers

NY State Available
Yes

Specimen

Specimen Type
Varies

Ordering Guidance
If a prenatal specimen has already been submitted as part of another diagnostic test, a second prenatal specimen is not required. If a prenatal specimen has not yet been submitted, submit only 1 prenatal specimen.

Specimen Required
Both maternal blood and prenatal specimens are required for testing; order this test on both specimens under separate order numbers.

Maternal Specimen
Specimen Type: Maternal whole blood
Container/Tube: Lavender top (EDTA) or yellow top (ACD)
Specimen Volume: 3 mL
Collection Instructions:
1. Invert several times to mix blood.
2. Send whole blood specimen in original tube. **Do not aliquot**.
Specimen Stability Information: Ambient (preferred) 4 days/Refrigerated 4 days/Frozen 4 days
Additional Information:
1. Specimens are preferred to be received within 4 days of collection. Extraction will be attempted for specimens received after 4 days, and DNA yield will be evaluated to determine if testing may proceed.
2. To ensure minimum volume and concentration of DNA are met, the requested volume must be submitted. Testing may be canceled if DNA requirements are inadequate.

Prenatal/Proband Specimens
Due to its complexity, consultation with the laboratory is required for all prenatal testing; call 800-533-1710 to speak to a genetic counselor.

Specimen Type: Cord blood

Container/Tube: Lavender top (EDTA) or yellow top (ACD)
Specimen Volume: 3 mL
Collection Instructions:
1. Collect whole blood from an umbilical cord either prenatally or postnatally.
2. Invert several times to mix blood.
3. Send whole blood specimen in original tube. **Do not aliquot**.
Specimen Stability Information: Ambient (preferred) 4 days/Refrigerated 4 days/Frozen 4 days
Additional Information:
1. Specimens are preferred to be received within 4 days of collection. Extraction will be attempted for specimens received after 4 days, and DNA yield will be evaluated to determine if testing may proceed.
2. To ensure minimum volume and concentration of DNA are met, the requested volume must be submitted. Testing may be canceled if DNA requirements are inadequate.

Specimen Type: Amniotic fluid
Container/Tube: Amniotic fluid container
Specimen Volume: 20 mL
Specimen Stability Information: Ambient (preferred) <24 hours/Refrigerated <24 hours
Additional Information: Specimen will only be tested after culture.
1. Specimens are preferred to be received within 24 hours of collection. Culture and extraction will be attempted for specimens received after 24 hours and will be evaluated to determine if testing may proceed.
2. A separate culture charge will be assessed under CULAF / Culture for Genetic Testing, Amniotic Fluid. An additional 2 to 3 weeks are required to culture amniotic fluid before genetic testing can occur.

Specimen Type: Cultured amniocytes
This does not include cultured chorionic villi.
Container/Tube: T-25 flask
Specimen Volume: 2 Flasks
Collection Instructions: Submit confluent cultured cells from another laboratory
Specimen Stability Information: Ambient (preferred) <24 hours/Refrigerated <24 hours
Additional Information:
1. Specimens are preferred to be received within 24 hours of collection. Culture and extraction will be attempted for specimens received after 24 hours and will be evaluated to determine if testing may proceed.
2. A separate culture charge will be assessed under CULFB / Fibroblast Culture for Biochemical or Molecular Testing.

Specimen Type: Chorionic villi
Container/Tube: 15-mL tube containing 15 mL of transport media
Specimen Volume: 20 mg
Specimen Stability Information: Ambient (preferred) <24 hours/Refrigerated <24 hours
Additional Information: Specimen will only be tested after culture.
1. Specimens are preferred to be received within 24 hours of collection. Culture and extraction will be attempted for specimens received after 24 hours and will be evaluated to determine if testing may proceed.
2. A separate culture charge will be assessed under CULFB / Fibroblast Culture for Biochemical or Molecular Testing. An additional 3 to 4 weeks are required to culture fibroblasts before genetic testing can occur.

Specimen Type: Cultured chorionic villi
Container/Tube: T-25 flasks
Specimen Volume: 2 Full flasks
Collection Instructions: Submit confluent cultured cells from another laboratory.
Specimen Stability Information: Ambient (preferred) <24 hours/Refrigerated <24 hours
Additional Information:
1. Specimens are preferred to be received within 24 hours of collection. Culture and extraction will be attempted for specimens received after 24 hours and will be evaluated to determine if testing may proceed.
2. A separate culture charge will be assessed under CULFB / Fibroblast Culture for Biochemical or Molecular Testing.

Forms

New York Clients-Informed consent is required. Document on the request form or electronic order that a copy is on file. The following documents are available:
-Informed Consent for Genetic Testing (T576)
-Informed Consent for Genetic Testing-Spanish (T826)

Specimen Minimum Volume

See Specimen Required

Reject Due To

All specimens will be evaluated by Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Varies		

Clinical & Interpretive

Clinical Information

One of the risks associated with prenatal testing is maternal cell contamination (MCC), which can occur when a fetal specimen comes into contact with maternal blood or tissue. The risk of MCC is associated with procedures such as chorionic villus sampling, amniocentesis, or extraction of fetal blood from the umbilical cord (cord blood). If MCC is present, the maternal DNA may mask the results of any genetic testing performed on the fetal DNA. Therefore, the results of prenatal testing may be compromised.

To rule out the presence of MCC, a maternal blood specimen is necessary for comparison of maternal and fetal chromosomal markers. The presence of both maternal and nonmaternal alleles for each fetal marker indicates the fetal specimen is not contaminated. MCC is confirmed when both alleles in the fetus are maternal.

Reference Values

An interpretative report will be provided.

Interpretation

The interpretive report includes an overview of the findings as well as the associated clinical significance.

Cautions
This test does not rule out the presence of low-level maternal cell contamination (<5%).

Clinical Reference
1. Nagan N, Faulkner NE, Curtis C, Schrijver I; MCC Guidelines Working Group of the Association for Molecular Pathology Clininical Practice Committee. Laboratory guidelines for detection, interpretation, and reporting of maternal cell contamination in prenatal analyses a report of the association for molecular pathology. J Mol Diagn. 2011;13(1):7-11. doi:10.1016/j.jmoldx.2010.11.013
2. Smeekens SP, Leferink M, Yntema HG, Kamsteeg EJ. Maternal cell contamination in postnatal umbilical cord blood samples implies a low risk for genetic misdiagnoses. Prenat Diagn. 2024;44(11):1304-1309. doi:10.1002/pd.6595

Performance

Method Description
The maternal blood genotype is compared to the fetal genotype, derived from amniocyte DNA or chorionic villus DNA, utilizing a polymerase chain reaction-based assay with a set of microsatellite repeat markers.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Varies

Report Available
10 to 11 days

Specimen Retention Time
Whole blood: 28 days (if available); Extracted DNA: 3 months

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

81265
88233-(if appropriate)
88240-(if appropriate)
88235-(if appropriate)
81266-each additional specimen

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
MATCC	Maternal Cell Contamination, B	40704-9

Result ID	Test Result Name	Result LOINC® Value
53285	Result Summary	50397-9
53286	Result	40704-9
53287	Interpretation	69047-9
53288	Reason for referral	42349-1
53289	Specimen	31208-2
53290	Source	31208-2
53291	Released By	18771-6
55150	Method	85069-3