MAYO CLINIC LABORATORIES

Test Definition: SRYF

Sex-Determining Region Y, Yp11.3 Deletion, FISH

Overview

Useful For

Detecting the deletion or addition of the *SRY* gene in conjunction with conventional chromosome studies (CHRCB / Chromosome Analysis, Congenital Disorders, Blood)

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
_I099	Interphases, 25-99	No, (Bill Only)	No
_I300	Interphases, >=100	No, (Bill Only)	No
_IL25	Interphases, <25	No, (Bill Only)	No
_M30	Metaphases, >=10	No, (Bill Only)	No
_ML10	Metaphases, 1-9	No, (Bill Only)	No
_PADD	Probe, +1	No, (Bill Only)	No
_PB02	Probe, +2	No, (Bill Only)	No
_PB03	Probe, +3	No, (Bill Only)	No
_PB1	Probe Set, 1st	No, (Bill Only)	No

Genetics Test Information

This test is appropriate to aid in detecting the presence or absence of the *SRY* gene in XX males and XY females. Testing must be ordered in conjunction with conventional chromosome studies (CHRCB / Chromosome Analysis, Congenital Disorders, Blood).

Testing Algorithm

This test includes a charge for application of the first probe set (2 fluorescence in situ hybridization (FISH) probes) and professional interpretation of results. Additional charges will be incurred for application of all reflex probes performed. Analysis charges will be incurred based on the number of cells analyzed per probe set. If no cells are available for analysis, no analysis charges will be incurred.

Special Instructions

- Final Disposition of Fetal/Stillborn Remains
- Informed Consent for Genetic Testing
- Informed Consent for Genetic Testing (Spanish)

Method Name

Fluorescence In Situ Hybridization (FISH)

NY State Available

Yes

Specimen

Specimen Type
Varies

Additional Testing Requirements
This test must be ordered in conjunction with conventional chromosome studies (CHRCB / Chromosome Analysis, Congenital Disorders, Blood).

Shipping Instructions
Advise Express Mail or equivalent if not on courier service.

Necessary Information
Provide a reason for testing with each specimen. The laboratory will not reject testing if this information is not provided, but appropriate testing and interpretation may be compromised or delayed.

Specimen Required
Submit only 1 of the following specimens:

Specimen Type: Amniotic fluid
Container/Tube: Amniotic fluid container
Specimen Volume: 20-25 mL
Collection Instructions:
1. Optimal timing for specimen collection is during 14 to 18 weeks of gestation, but specimens collected at other weeks of gestation are also accepted. Provide gestational age at the time of amniocentesis.
2. Discard the first 2 mL of amniotic fluid.
Additional Information:
1. Unavoidably, about 1% to 2% of mailed-in specimens are not viable.
2. Bloody specimens are undesirable.
3. If the specimen does not grow in culture, you will be notified within 7 days of receipt.
4. Results will be reported and also telephoned or faxed, if requested.

Specimen Type: Autopsy
Supplies: Hank's Solution (T132)
Container/Tube: Sterile container with sterile Hank's balanced salt solution , Ringer's solution, or normal saline
Specimen Volume: 4 mm diameter
Collection Instructions:
1. Wash biopsy site with an antiseptic soap.
2. Thoroughly rinse area with sterile water.
3. Do not use alcohol or iodine preparations.
4. Biopsy specimens are best taken by punch biopsy to include full thickness of dermis.

Specimen Type: Blood

Container/Tube: Green top (sodium heparin)
Specimen Volume: 4 mL
Collection Instructions:
1. Invert several times to mix blood.
2. Send whole blood specimen in original tube. **Do not aliquot**.
3. Other anticoagulants are not recommended and are harmful to the viability of the cells.

Specimen Type: Chorionic villus
Supplies: CVS Media (RPMI) and Small Dish (T095)
Container/Tube: 15-mL tube containing 15 mL of transport media
Specimen Volume: 20-25 mg
Collection Instructions:
1. Collect specimen by the transabdominal or transcervical method.
2. Transfer chorionic villi to a Petri dish containing transport medium.
3. Using a stereomicroscope and sterile forceps, assess the quality and quantity of the villi and remove any blood clots and maternal decidua.

Specimen Type: Fixed cell pellet
Container/Tube: Sterile container with a 3:1 fixative (methanol:glacial acetic acid)
Specimen Volume: Entire specimen

Specimen Type: Products of conception or stillbirth
Supplies: Hank's Solution (T132)
Container/Tube: Sterile container with sterile Hank's balanced salt solution, Ringer's solution, or normal saline
Specimen Volume: 1 cm(3) of placenta (including 20-mg of chorionic villi) **and** a 1-cm(3) biopsy specimen of muscle/fascia from the thigh
Collection Instructions: If a fetus cannot be specifically identified, collect villus material or tissue that appears to be of fetal origin.
Additional Information: Do not send entire fetus.

Specimen Type: Skin biopsy
Supplies: Hank's Solution (T132)
Container/Tube: Sterile container with sterile Hank's balanced salt solution, Ringer's solution, or normal saline
Specimen Volume: 4 mm diameter
Collection Instructions:
1. Wash biopsy site with an antiseptic soap.
2. Thoroughly rinse area with sterile water.
3. **Do not** use alcohol or iodine preparations.
4. A local anesthetic may be used.
5. Biopsy specimens are best taken by punch biopsy to include full thickness of dermis.

Forms

1. **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)
2. Final Disposition of Fetal/Stillborn Remains (if fetal specimen is sent).

Specimen Minimum Volume
Amniotic fluid: 5 mL
Autopsy, skin biopsy: 4 mm
Blood: 2 mL
Chorionic villi: 5 mg
Fixed cell pellet: 1 pellet
Products of conception: 1 cm(3)

Reject Due To
All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Refrigerated (preferred)		
	Ambient		

Clinical & Interpretive

Clinical Information
This test is appropriate for individuals with a 46,XX karyotype and phenotypically normal male external genitalia, a 46,XY karyotype and phenotypically normal female external genitalia, clinical features suggestive of 46,XX testicular disorder of sex development with normal male external genitalia, and clinical features suggestive of 46,XY complete gonadal dysgenesis.

The *SRY* (sex-determining region on the Y chromosome) gene is required for normal embryonic wolffian (male) genital development, although numerous other genes are involved in completing the process of normal male development. Some gene mutations block the action of *SRY* in development. Thus, a 46,XY individual with an *SRY* deletion or mutation will develop as a female, and a 46,XX individual with translocation of *SRY* to 1 X chromosome will develop as a male. Structural abnormalities of the Y chromosome result in a spectrum of abnormalities from primary infertility (male or female) to various forms of ambiguous genitalia. *SRY*-negative 46,XX males often have ambiguous genitalia, whereas those who are positive for *SRY* usually have a normal male phenotype with azoospermia. *SRY*-negative 46,XY females may have another mutation, such as 1 involving the *SOX9* gene.

We recommend conventional chromosome studies (CHRCB / Chromosome Analysis, Congenital Disorders, Blood) to detect Y chromosome abnormalities and to rule out other chromosome abnormalities or translocations, and fluorescence in situ hybridization (FISH) studies to detect cryptic translocations involving the *SRY* region that are not demonstrated by conventional chromosome studies.

Reference Values

An interpretive report will be provided.

Interpretation

Any male individual with an *SRY* signal on a structurally normal Y chromosome is considered negative for a deletion in the region tested by this probe. Any patient with a fluorescence in situ hybridization (FISH) signal pattern indicating loss of the critical region will be reported as having a deletion of the regions tested by this probe. Any patient with a FISH signal on an X chromosome will be reported as having a cryptic X;Y translocation involving the critical region.

Cautions

Because this fluorescence in situ hybridization (FISH) test is not approved by the U.S. Food and Drug Administration, it is important to confirm *SRY* deletions/duplications by other established methods, such as clinical history or physical evaluation.
Chromosomal microarray (CMACB / Chromosomal Microarray, Congenital, Blood or CMAP / Chromosomal Microarray, Prenatal, Amniotic Fluid/Chorionic Villus Sampling) may be the more appropriate test to detect unbalanced translocations, deletions or duplications.

Interfering factors
-Cell lysis caused by forcing the blood quickly through the needle
-Use of an improper anticoagulant or improperly mixing the blood with the anticoagulant
-Excessive transport time
-Inadequate amount of specimen may not permit adequate analysis
-Improper packaging may result in broken, leaky, and contaminated specimen during transport
-Exposure of the specimen to temperature extremes (freezing or >30 degrees C) may kill cells and interfere with attempts to culture cells
-In prenatal specimens, a bloody specimen may interfere with attempts to culture cells and contamination by maternal cells may cause interpretive problems

Supportive Data

Using a probe for the *SRY* critical region, fluorescence in situ hybridization (FISH) analysis was performed on a series of 46 patient specimens, whole blood or amniotic fluid, and results were compared to cytogenetic analyses and the patient's phenotype.

Of 20 phenotypic females:
-12 with a 45,X karyotype or an X duplication exhibited no *SRY* signal
-8 with a 46,XY karyotype or an abnormal Y were *SRY* positive

Of 20 phenotypic males:
-7 of 8 with a 46,XX karyotype were *SRY* negative
-13 with a 46, XY with a normal or rearranged Y chromosome were *SRY* positive

Of 25 controls:
-13 males exhibited *SRY* on the Y chromosome
-12 females exhibited no *SRY* signal

Clinical Reference

1. Mohnach l, Fechner PY, Keegan CE: Nonsyndromic disorders of testicular development overview. In: Pagon RA, Adam MP, Ardinger HH, et al, eds. GeneReviews (Internet). University of Washington, Seattle; 2008. Updated August 18.2022. Accessed April 28. 2023. Available at www.ncbi.nlm.nih.gov/books/NBK1547
2. Emmanule CD, Vilain EJ: Nonsyndromic 46,XX Testicular disorder of sex development. In: Pagon RA, Adam MP, Ardinger HH, et al, eds. GeneReviews (Internet). University of Washington, Seattle; 2003. Updated May 26. 2022. Accessed April 26,2023. Available at www.ncbi.nlm.nih.gov/books/NBK1416/

Performance

Method Description
This test is performed using a commercially available enumeration strategy probe set including *SRY* (Yp11.3) and X chromosome control probe. Metaphase cells are examined for the presence of *SRY*.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
7 to 10 days

Specimen Retention Time
Amniotic Fluid . (remaining supernatant/whole Fluid aliquots): Discarded 14 days after report. Blood: 4 weeks. Products of Conception (identifiable fetal tissue): Cremated quarterly after results reported. All Other Specimens: Discarded when results reported.

Performing Laboratory Location
Rochester

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 using an analyte specific reagent. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

88271x2, 88291-DNA probe, each (first probe set), Interpretation and report
88271x2-DNA probe, each; each additional probe set (if appropriate)
88271x1-DNA probe, each; coverage for sets containing 3 probes (if appropriate)
88271x2-DNA probe, each; coverage for sets containing 4 probes (if appropriate)
88271x3-DNA probe, each; coverage for sets containing 5 probes (if appropriate)
88273 w/modifier 52-Chromosomal in situ hybridization, less than 10 cells (if appropriate)
88273-Chromosomal in situ hybridization, 10-30 cells (if appropriate)
88274 w/modifier 52-Interphase in situ hybridization, <25 cells, each probe set (if appropriate)
88274-Interphase in situ hybridization, 25 to 99 cells, each probe set (if appropriate)
88275-Interphase in situ hybridization, 100 to 300 cells, each probe set (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
SRYF	SRY, Yp11.3, FISH	81748-6

Result ID	Test Result Name	Result LOINC® Value
52003	Result Summary	50397-9
52005	Interpretation	69965-2
54565	Result	62356-1
CG717	Reason for Referral	42349-1
CG718	Specimen	31208-2
52006	Source	31208-2
52007	Method	85069-3
52004	Additional Information	48767-8
52008	Released By	18771-6
53850	Disclaimer	62364-5