Fragile X, PCR and Southern

RESULT: 30 CGG repeats

INTERPRETATION:
Negative: not a carrier of a fragile X expansion mutation. This result is not associated with fragile X syndrome.

COMMENTS:
The diagnosis of fragile X syndrome is not confirmed by this analysis. Other causes of fragile X syndrome include rare point mutations and deletions in the FMR1 gene, or mutations in other genes such as FXE (fragile X E). Further diagnostic work-up is recommended. Routine chromosome analysis is recommended in the diagnostic work-up for other causes of mental retardation.

Fragile X syndrome is caused by an expansion of CGG repeat sequences in the FMR1 gene in 99% of cases. There are rare FMR1 mutations including missense mutations and gene deletions which cause fragile X syndrome. The interpretation is based on the following ranges of repeat sequences:

Negative: less than 45 repeats
Intermediate: 45-54 repeats
Premutation: 55-200 repeats with normal methylation pattern
Full Mutation: greater than 200 repeats with abnormal methylation pattern

Reported CGG repeat sizes may vary as follows: +/- one for repeats less than 60, and +/- two to four for repeats in the 60-120 range respectively. For repeats greater than 120, the accuracy is +/- 10%.

This interpretation is based on the clinical and family relationship information provided and the current understanding of the molecular genetics of this condition. Genetic counseling is recommended for any individual seeking additional information regarding interpretation of genetic test results.

METHODS/LIMITATIONS:
Isolated DNA is tested by the polymerase chain reaction (PCR) to determine the size of the CGG repeats within the FMR1 gene. PCR products are generated using a fluorescence labeled primer and sized by capillary gel electrophoresis. If indicated, Southern blot analysis is performed by hybridizing the probe StB12.3 to EcoRI- and Eagl-digested DNA. The analytical sensitivity of both Southern blot and PCR analyses is 99% for expansion mutations in the FMR1 gene. False positive or negative results may occur for reasons that include somatic or tissue-specific mosaicism, rare genetic variants, blood transfusions, bone marrow transplantation, or erroneous representation of family history.

REFERENCES:

Results Released By: Joseph B. Kearney, Ph.D., Director
Report Released By: Christine Vaughan, MS, CGC, Genetic Counselor
AMENDED REPORT

Test Results of: NORMAL, 511655
DOB: 01/11/1990    Age: 29.0 Y    Sex: F
Collected on: 01/26/2019
Received on: 01/26/2019
Reported on: 02/11/2019

Patient ID#:

Branch Number: POE00
Account Number: 90000999
Specimen Number: 026-225-9624-0
Specimen Type: Blood

Test: Fragile X, PCR and Southern

RESULTS: PCR and Southern Blot: 30 CGG repeats

INTERPRETATION:
Negative: not a carrier of a fragile X expansion mutation. This result is not associated with fragile X syndrome.

COMMENTS:
The diagnosis of fragile X syndrome is not confirmed by this analysis. Other causes of fragile X syndrome include rare point mutations and deletions in the FMR1 gene, or mutations in other genes such as FXE (fragile X E). Further diagnostic work-up is recommended. Routine chromosome analysis is recommended in the diagnostic work-up for other causes of mental retardation.

Fragile X syndrome is caused by an expansion of CGG repeat sequences in the FMR1 gene in 99% of cases. There are rare FMR1 mutations including missense mutations and gene deletions which cause fragile X syndrome. The interpretation is based on the following ranges of repeat sequences:

- Negative: <45 repeats
- Intermediate: 45-54 repeats
- Premutation: 55-200 repeats with normal methylation pattern
- Full Mutation: >200 repeats with abnormal methylation pattern

Reported CGG repeat sizes may vary as follows: +/- one for repeats less than 60, and +/- two to four for repeats in the 60-120 range respectively. For repeats greater than 120, the accuracy is +/- 10%.

This interpretation is based on the clinical and family relationship information provided and the current understanding of the molecular genetics of this condition. Genetic counseling is recommended for any individual seeking additional information regarding interpretation of genetic test results.

METHODS/LIMITATIONS:
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This test was developed and its performance characteristics determined by Laboratory Corporation of America Holdings (LabCorp). It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational research.

REFERENCES:

Results Released By: Joseph B. Kearney, Ph.D., Director
Report Released By: Christine Vaughan, MS, CGC, Genetic Counselor

LabCorp
1912 Alexander Drive, RTP, NC, 27709 (800) 345-4363

This document contains private and confidential health information protected by state and federal law.
### Ordered Items

<table>
<thead>
<tr>
<th>Fragile X, PCR and Southern</th>
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<table>
<thead>
<tr>
<th>TESTS</th>
<th>RESULT</th>
<th>FLAG</th>
<th>UNITS</th>
<th>REFERENCE INTERVAL</th>
<th>LAB</th>
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<td>Fragile X DNA</td>
<td></td>
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<td>Fragile X Analysis by Southern Blot is indicated for this sample. Final report will follow under separate cover.</td>
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| Fragile X Southern Blot   |        |      |       |                    |     |
|                          |        |      |       |                    |     |
| RESULTS: PCR and Southern Blot: 35 and 230-560 CGG repeats. COMPLETELY METHYLATED |
| INTERPRETATION:          |        |      |       |                    |     |
| Full mutation carrier of fragile X syndrome. This individual is at risk for having children with fragile X syndrome. Additionally, approximately 50% of females with a full mutation have fragile X syndrome-associated symptoms. See comments. |
| COMMENTS:                |        |      |       |                    |     |
| A full mutation result is associated with a wide range of clinical expression in females: approximately 50% have mental retardation of variable severity and 50% are intellectually normal. Full mutations (greater than 200 repeats) are sized by Southern blot analysis. Genetic counseling is recommended for discussion of the clinical implications of this result for this individual and for at-risk family members. |

Fragile X syndrome is caused by an expansion of CGG repeat sequences in the FMR1 gene in 99% of cases. There are rare FMR1 mutations including missense mutations and gene deletions which cause fragile X syndrome. The interpretation is based on the following ranges of repeat sequences:

- Negative: less than 45 repeats
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<tr>
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<th>RESULT</th>
<th>FLAG</th>
<th>UNITS</th>
<th>REFERENCE INTERVAL</th>
<th>LAB</th>
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<tr>
<td>Intermediate:</td>
<td>45-54 repeats</td>
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<tr>
<td>Premutation:</td>
<td>55-200 repeats with normal</td>
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<td>methylation pattern</td>
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<tr>
<td>Full Mutation:</td>
<td>greater than 200 repeats with</td>
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<td></td>
<td>abnormal methylation pattern</td>
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Reported CGG repeat sizes may vary as follows: +/- one for repeats less than 60, and +/- two to four for repeats in the 60-120 range respectively. For repeats greater than 120, the accuracy is +/- 10%.

This interpretation is based on the clinical and family relationship information provided and the current understanding of the molecular genetics of this condition. Genetic counseling is recommended for any individual seeking additional information regarding interpretation of genetic test results.

METHODS/LIMITATIONS:
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REFERENCES:

Results Released By: Joseph B. Kearney, Ph.D., Director
Report Released By: Jordan D. Dix, MS, CGC, Genetic Counselor

Fragile X Syndrome, PDF
January 31, 2019

LabCorp Test Master
Test Account
5450 Millstream Road
MCLEANsville, NC 27301

Branch Number: POE00
Account Number: 90000999
Specimen Number: 026-225-9625-0
Specimen Type: Blood

Patient ID#:

Test: Fragile X, PCR and Southern

RESULTS: PCR and Southern Blot: 35 and 230-560 CGG repeats. COMPLETELY METHYLATED

INTERPRETATION:
Full mutation carrier of fragile X syndrome. This individual is at risk for having children with fragile X syndrome. Additionally, approximately 50% of females with a full mutation have fragile X syndrome-associated symptoms. See comments.

COMMENTS:
A full mutation result is associated with a wide range of clinical expression in females: approximately 50% have mental retardation of variable severity and 50% are intellectually normal. Full mutations (>200 repeats) are sized by Southern blot analysis. Genetic counseling is recommended for discussion of the clinical implications of this result for this individual and for at-risk family members. Prenatal diagnosis is available.

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<th>Category</th>
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<tr>
<td>Negative</td>
<td>&lt;45 repeats</td>
</tr>
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<td>Full Mutation</td>
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