

# FRAGILE X SYNDROME

- updated 08-10-09

Mendelian Inheritance in Man number: [309550](#)

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Fragile X syndrome is one of the most common genetic causes of mental retardation in males with an estimated incidence of 1:4000-6250 in males. Males affected with Fragile X typically have moderate mental retardation, and can present with characteristic physical features such as a long face, prominent ears and macroorchidism. Approximately 50% of females with full mutations are affected. Their level of developmental impairment is, on average, less severe than that seen in males. Fragile X is usually caused by a trinucleotide expansion in the *FMR1* gene on the X chromosome. Normal individuals have <40 CGG repeats. Individuals with pre-mutation alleles have 59-230 repeats whereas individuals with intermediate sized alleles ("gray zone" alleles) have 41-58 repeats, broadly defined. Individuals with a full mutation have > 230- > 2000 repeats.

## INDICATIONS FOR DIRECT TESTING

- Family history of Fragile X
- Patient with mental retardation, developmental delay, or autistic features

## TESTING METHODOLOGY

DNA is isolated and subjected to *Eco* RI and *Eag* I restriction digest followed by Southern blot analysis using the DNA probe, StB12.3 to determine methylation status of the *FMR1* gene and approximate number of trinucleotide repeats. Polymerase chain reaction analysis is used to further define the repeat number more precisely.

## SPECIMEN REQUIREMENTS

Minimum of 3 mL whole blood in EDTA (purple topped) tubes.

## TRANSPORT

If the specimen is from clinics within UAB or Kirklin Clinic, please call 934-5562 for pickup. If specimens are being sent from some other location, please ship via **UPS Overnight Priority**. Specimens must be packaged to prevent breakage and absorbent material must be included in the package to absorb liquids in the event that breakage occurs. Also, the package must be shipped in double watertight containers (e.g. a specimen pouch + the shipping companies Diagnostic Envelope). Please contact us (Email – [mgl@genetics.uab.edu](mailto:mgl@genetics.uab.edu), Phone – 205-934-5562) prior to sample shipment and provide us with the date of shipment and the tracking number of the package.

**TURN AROUND TIME:** 2-3 weeks

**CPT CODES AND PRICE:** \$280 USD

83891, 83892 (x2), 83909 (x2), 83894, 83896 (x2), 83897, 83898, 83912

**Please note that prices listed correspond to institutional rates; please contact the lab for insurance rates.**

Payment may be made by Money order, Cashier's check, VISA or MasterCard. We will also bill requesting institutions. Please call for more information.

## **REQUIRED FORMS**

### [Test Requisition Form](#)

**Note:** Requests for Molecular Genetic testing will **not** be accepted for the following reasons:

- No label (patients full name and date of collection) on the specimens
- No referring physician's or genetic counselor's names and addresses
- No billing information if being paid for by an institution
- No informed consent

**For more information, test requisition forms, or sample collection, please call: 205-934-5562.**

## **REFERENCES**

[Fu et al. Variation of the CGG repeat at the fragile X site results in genetic instability: resolution of the Sherman paradox. \*Cell\*. 1991 Dec 20;67\(6\):1047-58.](#)

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[Nolin SL, et al. \(2003\) Expansion of the fragile X CGG repeat in females with premutation or intermediate alleles. \*Am J Hum Genet\*. 2003 Feb;72\(2\):454-64.](#)

[Oberle, et al. Instability of a 550-bp DNA segment and abnormal methylation in Fragile X Syndrome. \*Science\* 252:1097-1102 \(1991\).](#)

[Oostra BA, Willemsen R. The X chromosome and fragile X mental retardation. \*Cytogenet Genome Res\*. 2002;99\(1-4\):257-64.](#)

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