Most common form of inherited intellectual disability in boys

Characteristic appearance in boys: long face, protruding ears, broad forehead, low muscle tone

Behavioral abnormalities: developmental disabilities, autism spectrum disorder

An FMR1 mutation is responsible for about 5% of autism cases
Underlying Genetics

- FXS is caused by a loss-of-function mutation in the FMR1 gene on the X chromosome
  - CGG trinucleotide repeat expansion and abnormal gene methylation

- Affected Gene
  Official Name: “Fragile X Mental Retardation 1”
  Gene Symbol: FMR1
  Locus: Xq27.3

Diagnostic Methods

- **Classical**
  IQ tests, behavior observation

- **Novel**
  - Cytogenetics
  - Protein Testing
  - Molecular Genetic Testing
Protein Testing

• FMR1 protein (FMRP) is not produced in individuals with FXS

• Some labs will measure the production of FMRP to diagnose FXS

Source: http://www.els.net/
Molecular Genetic (DNA) Testing

- Severity of FXS is correlated with the number of CGG repeats
- Number of repeats
  - Normal Alleles: 5-44
  - Premutation: 55-200
  - Mutation (FXS): more than 200
- Best diagnostic method

Source: [http://cibsr.stanford.edu](http://cibsr.stanford.edu)
Treatment Methods

• Genetic understanding has not led to a novel treatment

• Early intervention, special education

• Pharmacological treatment for specific symptoms (i.e. ADHD medication, anxiety medication)
Sources

- http://www.sciencedirect.com