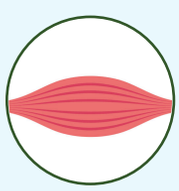
MEDGENOME | ACTIA Inherited Disease Genetics

CAP ACCREDITED COLLEGE of AMERICAN PATHOLOGISTS

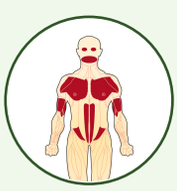
Facioscapulohumeral Muscular Dystrophy Type 1 (FSHD1)

India's first Optical Genome Mapping based test that screens genetic alterations in FSHD1.

Facioscapulohumeral Muscular Dystrophy (FSHD) is a common form of muscular dystrophy with an extremely complex genotype. It is progressive myopathy which accounts for 2 to 3% of the muscular dystrophy cases in India [1].



Facioscapulohumeral Muscular Dystrophy type 1 (FSHD) accounts for 95% of the FSHD cases, which is caused by a contraction of the polymorphic macrosatellite repeat D4Z4 on chromosome 4q35.[2]

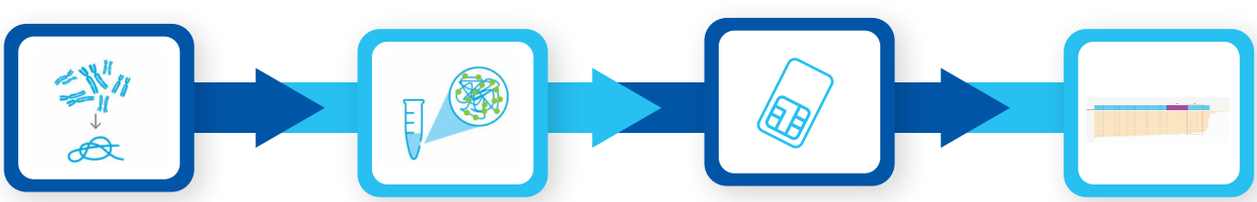


Affected individuals with FSHD1 have repeat contraction with total size of repeats from 1-10, healthy individuals repeat units are sized between 11-150[2]

Processing Details:

Ultra high molecular weight DNA is isolated

Labelled DNA is transferred to saphyr chip & machine



Specific sequences across the entire genome is labeled

Whole genome consensus is cross-mapped with reference to determine D4Z4 repeat units.

1.Tamhankar, P.M. and Phadke, S.R., 2010. Clinical profile and molecular diagnosis in patients of facioscapulohumeral dystrophy from Indian subcontinent. Neurology India, 58(3), p.436.

2.Lemmers, R.J., O'Shea, S., Padberg, G.W., Lunt, P.W. and van der Maarel, S.M., 2012. Best practice guidelines on genetic diagnostics of Facioscapulohumeral muscular dystrophy: workshop 9th June 2010, LUMC, Leiden, The Netherlands. Neuromuscular disorders, 22(5), pp.463-470.

Features:

FSDH1 diagnosis requires accurate sizing of a very large repeat region in the subtelomeric region of chr 4q35. It also requires to determine the non-pathogenic repeat region on 10q26, which is almost identical to chr 4q35.

Optical genome mapping overcomes a number of technical limitations of Southern blot by providing optical mapping of D4Z4 macrosatellite repeat arrays on specific chr 4q and chr 10q alleles and more precise D4Z4 repeat sizing.

The bionano EnFocus FSHD analysis performs the entire detection automatically, and validation studies have shown perfect concordance with the gold standard method.

Validated as per the CAP guidelines with specificity and sensitivity =100%.

Common Questions:

Does this test detect both FSHD1 and FSHD2?

No, This test only assesses repeat contraction associated with FSHD1 disease.

What if FSHD1 test is negative?

This rules out the possibility of repeat contraction in the D4Z4 macrosatellite region. More comprehensive genetic analysis like Whole Exome Sequencing may be performed upon clinicians request.

Test Details:

Test Code	Test Name	Sample Type	TAT
MGM2719	FSHD1 repeat contraction testing by Optical Genome Mapping	Blood (3 – 6 ml) in purple top (EDTA) tube	8 weeks
MGM274	Whole Exome Sequencing (80-100X)	Blood (3 – 6 ml) in purple top (EDTA) tube	4 weeks

Shipping Conditions:
Ship same day at 4^{0}C along with ice pack in the box (Do not freeze the specimen)

Sample Transportation:
Sample should reach the lab within 3 days of collection

Sample Extraction:
Within 4 days of collection (should be received at our lab between Monday-Friday)