

**ELUCIGENE ASHKENAZI SCREENING**

## ASHKENAZI JEWISH GENETIC SCREENING

The extraordinary genetic homogeneity in Jews of Eastern European (Ashkenazi) descent has resulted in a significantly increased risk of particular genetic disorders. Most of these are serious, untreatable neurodegenerative diseases that result in a short life expectancy.

The autosomal recessive pattern of inheritance of these diseases makes carrier screening a useful tool for disease prevention. The most widely known of these Ashkenazi diseases is Tay-Sachs, a fatal neurodegenerative disorder that causes blindness, mental retardation and death usually by early childhood. Tay-Sachs is significantly more frequent in the Jewish population (1/2,500) than in the general non-Jewish population (1/360,000). A number of other life-threatening disorders occur with similar frequency in this population.

Genetic Disease	Likelihood of being a carrier	Likelihood of having an affected child
Gaucher Disease	1 / 13	1 / 676
Cystic Fibrosis	1 / 26	1 / 2,500
Tay-Sachs Disease	1 / 26	1 / 2,500
Familial Dysautonomia	1 / 32	1 / 4,096
Glycogen Storage Disease	1 / 71	1 / 20,000
Canavan Disease	1 / 41	1 / 6,724
Mucopolipidosis IV	1 / 50	1 / 10,000
Niemann-Pick Disease	1 / 80	1 / 25,600
Fanconi Anemia	1 / 80	1 / 25,600
Blooms Syndrome	1 / 107	1 / 45,796
Aggregate Risk	1 / 4	1 / 336

### ELUCIGENE ASSAYS FOR MUTATION DETECTION

Four assays have been developed using the reliable and accurate ARMS (Amplification Refractory Mutation System) technology. Each assay enables multiple detection of highly relevant mutations in the Ashkenazi population and is available separately to allow for complete flexibility for the differing needs of mutation screening programs. The Elucigene CF7 assay detects 97% of Cystic Fibrosis mutations present in this population, while Elucigene ASHPLEX 1 identifies the eight mutations of the most prevalent diseases affecting the Ashkenazi population.

ELUCIGENE CF7	ELUCIGENE ASHPLEX 1	ELUCIGENE ASHPLEX 2	ELUCIGENE GAUCHER
D1152H	TS - 1277InsTATC	ML - 511-6944del	N370S (WILD TYPE)
1717-1G>A	TS - G269S	ML - 5534A>G	N370S (MUTANT)
G542X	TS - IVS12DSG>C+1	NPD - L302P	IVS2+1
W1282X	FD - R696P	NPD - R496L	84GG
N1303K	FD - 2507+6T>C	NPD - fsP330delC	R496H
F508del	CD - 693C>A	GSD - R83C	L444P
3849+10kbC>T	CD - 854A>C	BLM - 2281del6/ins7	
	FA - IVS4+4A>T		

TS = Tay-Sachs, ML = Mucopolipidosis IV, FD = Familial Dysautonomia, NPD = Niemann-Pick Disease, CD = Canavan Disease  
GSD = Glycogen Storage Disease (Type 1a), FA = Fanconi Anemia, BLM = Blooms Syndrome

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### ELUCIGENE KITS

All Elucigene kits comply with the EC Directive 98/79/CE, carry the CE mark and are manufactured within quality systems accredited to ISO9001:2008 and ISO13485:2003. Elucigene kits are available for:

#### Mutation detection

Gel based analysis

- Simple
- Cost efficient
- Easy analysis
- Accurate and reliable ARMS chemistry

Fluorescent based analysis

- Highly multiplexed
- Rapid analysis
- Compatible with ABI 3\*\*\* series Genetic Analyzers
- Accurate and reliable ARMS chemistry

#### Chromosome Aneuploidy

Elucigene QST\*R range

- Quantitative Fluorescent PCR (QF-PCR) technique
- Simple set up – just add DNA
- Quick – results in less than 4 hours
- Flexible – range of kits available





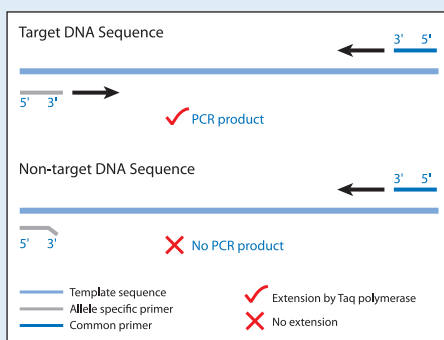
## ELUCIGENE ASHKENAZI SCREENING

### ARMS® CHEMISTRY

The Elucigene range of products for simple and rapid analysis of human genetic disease utilizes the highly accurate Amplification Refractory Mutation System (ARMS) allele specific amplification technology:

- Reliable and accurate mutation detection
- Multiplexed, multiple mutations detected in a single analysis
- Simple protocol
- Fluorescent or gel based ethidium bromide detection
- Gel based assays require minimal equipment
- Extensively validated technology, many publications

### ARMS PRINCIPLE



### OTHER KITS

The Elucigene range of kits for the *in vitro* diagnosis of human genetic diseases, currently includes mutation detection for cystic fibrosis, thrombophilia, alpha-1-antitrypsin, Ashkenazi Jewish carrier screening and chromosomal aneuploidy

### SCREENING AND TREATMENT

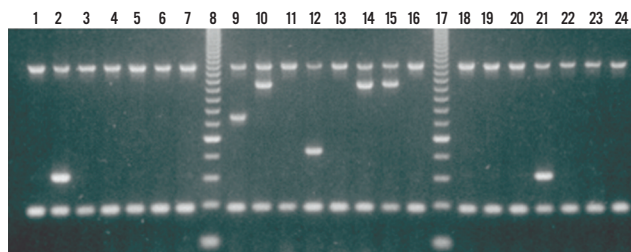
Using all four assays a total of 27 mutations can be detected in 10 different diseases that are highly prevalent within the Ashkenazi population. Use of the Elucigene assays in routine screening programs provides useful genetic information that can assist the family planning process, leading to a reduction in the observed frequency of individuals affected by these diseases.

### PROTOCOL AND TEST FORMAT

1. Prepare DNA from any source (e.g. whole liquid blood, dried bloodstain or mouthwash).
2. Add 5µL of AmpliTaq Gold® (not provided) diluted in loading dye and 5µL of test sample or control sample to each primer mix for PCR amplification.
3. Perform PCR amplification with AmpliTaq Gold Polymerase (~3.5 hours).
4. Run PCR products on 3% agarose gel (90 mins).
5. Visualise PCR products over UV light.

Laboratories require only a thermal cycler, microfuge and gel electrophoresis equipment.

### TYPICAL RESULTS – 22 Individuals tested with Ashplex 1



Key for Ashplex 1 gel photograph

- |                                      |                                |
|--------------------------------------|--------------------------------|
| 1. No mutations                      | 10. 1277insTATC (Tay-Sachs)    |
| 2. 854A>C (Canavan Disease)          | 12. IVS4+4A>T (Fanconi Anemia) |
| 8. 50bp Molecular Size Ladder        | 14. 1277insTATC (Tay-Sachs)    |
| 9. 2507+6T>C (Familial Dysautonomia) | 15. 1277insTATC (Tay-Sachs)    |
|                                      | 17. 50bp Molecular Size Ladder |
|                                      | 21. 854A>C (Canavan Disease)   |

### PRODUCT DETAILS

- Cat. No. CF007B4 Elucigene CF7 – 100 tests  
 Cat. No. AS008B2 Elucigene Ashplex 1 – 50 tests  
 Cat. No. SS007B2 Elucigene Ashplex 2 – 50 tests  
 Cat. No. GA005B2 Elucigene Gaucher – 50 tests



Elucigene kits and reagents are developed and manufactured within quality systems accredited to ISO 9001 and ISO 13485 and comply with the European Community Directive 98/79/EC. ELUCIGENE is a trademark of Gen-Probe Life Sciences Ltd. ARMS® is a registered trademark of AstraZeneca UK Ltd and is used under licence. The ARMS technology is the subject of European Patent No. 0332435, US Patent No. 5599890 and corresponding worldwide patents. AmpliTaq Gold is a registered trademark of Roche Molecular Systems, Inc. Licences for the *in vitro* diagnostic analysis of gene mutations detected by these reagents may be required and are the responsibility of reagent purchaser.

