

# Hereditary Hearing Loss test

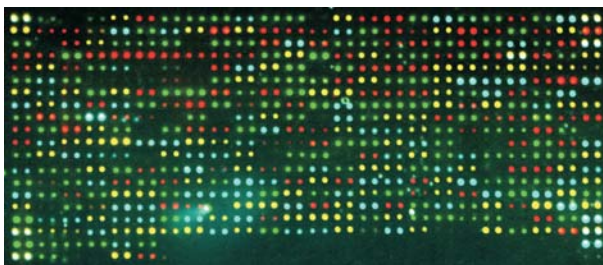
## ABOUT ASPER BIOTECH

Asper Biotech is a DNA testing company specializing in mutation detection and SNP screening services. Asper Biotech utilizes a robust and reliable arrayed primer extension technology, has a dedicated staff with over 6 years of experience and a commitment to provide quality screening to its partners.

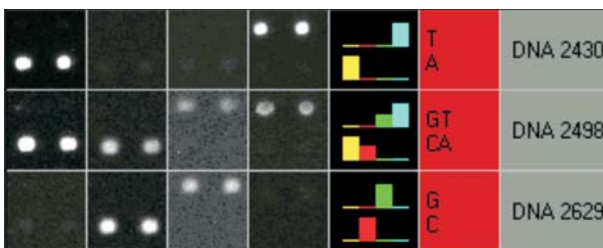
## THE CHIP

The new DNA test is a single assay, which enables comprehensive mutation detection in a number of genes linked to hereditary hearing loss. The test covers 200 mutations in multiple genes that underlie both nonsyndromic (Connexin 26, Connexin 30, Connexin 31, Connexin 43, pendrin, prestin, mitochondrial DNA) and certain syndromic (Connexin 26) causes of hearing loss.

Asper's hereditary hearing loss test has been extensively validated by pre-screened patient DNA samples in a well-designed blind study. As our previous published studies have shown, our tests are able to detect more than 98% of the existing genetic variations, so it's well suited for screening of known mutations related to hereditary hearing loss.



**Hereditary hearing mutation detection chip** for simultaneous screening of 200 mutations. The image above shows pseudo-color signals (A-yellow, C-red, G-green, T-cyan).



**35delG in connexin gene analyzed by APEX.** The deletion causes frame shift in protein level.

DNA sample No 2430 is **homozygous for 35delG**. We have detected in sense strand mutant T allele and in antisense strand mutant A allele (T/A).

DNA sample No 2498 is **heterozygous for 35delG**. We have detected in sense strand normal G allele and mutant T allele. In antisense strand we have detected normal C allele and mutant A allele (GT/CA).

DNA sample No 2629 has **normal** genotype for position **35** - in sense strand G allele and in antisense strand C allele (G/C).

## APEX

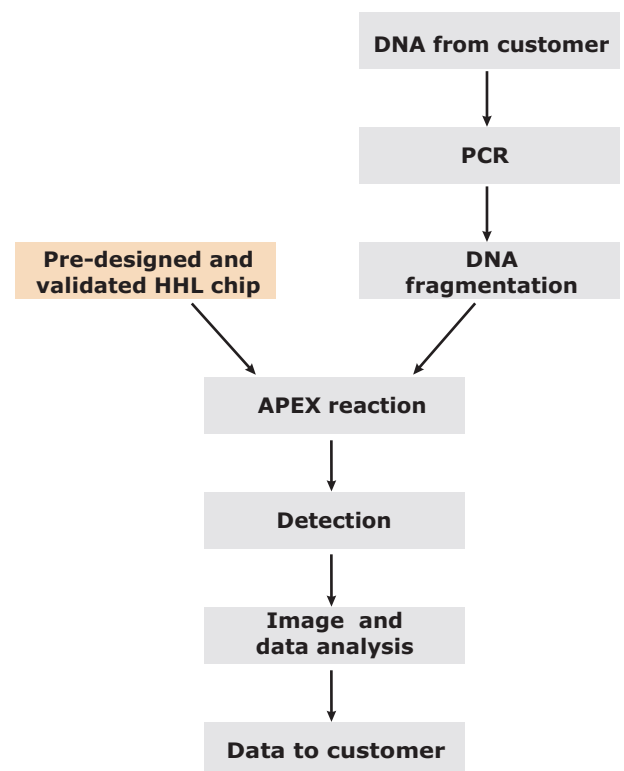
Arrayed **P**rimers **E**Xtension is a genotyping technology that combines the efficiency of a microarray-based assay with the comparable accuracy of the Sanger dideoxy sequencing.

## THE PROCESS

DNA sample analysis is performed under ISO:9001:2000 quality control regulations. Genomic DNA samples are sent to Asper, where the amplification reactions are performed using PCR, followed by fragmentation and purification reactions. Microarray slides are prepared and quality controlled. APEX reactions are performed and scanned followed by analysis of images. After careful analysis of the images some mutations are sent for re-analysis. A report with the final results is established and sent to the partner. Follow-up support is provided when needed.

In addition, to confirm the results with secondary method, Asper provides verification of the APEX findings by dideoxy sequencing on Applied Biosystems 3130 Genetic Analyzer.

## ROUTINE SCREENING OF DNA SAMPLES



For further information please contact Asper Biotech [info@asperbio.com](mailto:info@asperbio.com).

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## REQUIREMENTS FOR THE DNA SAMPLES

- The DNA quality needs to be ensured (best if isolated with Qiagen kits).
- At least 1,5 µg of genomic DNA is required for HHL chip analysis
- Preferred concentration range of DNA is 100-250 ng/µl.
- DNA samples should be provided in pure sterile water.

## TURNAROUND TIME

**Express delivery** – The results will be delivered in 3 – 5 working days after the arrival of samples.

**Standard delivery** – The results will be delivered approximately in 3 – 6 weeks after the arrival of samples.

## OTHER TESTS PROVIDED BY ASPER

Asper Biotech	Asper Ophthalmics
Thalassemia	Stargardt disease
Cystic Fibrosis	Leber's congenital amaurosis
DNA repair	Usher syndrome
Hereditary Hearing Loss	Aut. Rec. Retinitis Pigmentosa
Ashkenazi Jewish	Aut. Dom. Retinitis pigmentosa
	Bardet Biedl syndrome
	Aut. Dom. Optic Atrophy
	Con. Stat. Night Blindness
	Corneal Dystrophy

## RECOMMENDATIONS FOR SHIPMENT OF THE SAMPLES

- For speedy and secure delivery, international courier services, for example DHL, UPS and FedEx, are recommended; alternatively, you can send samples by air mail as small parcel.
- Since high quality DNA samples are stable, there is no need for shipment in dry or wet ice.
- Care should be taken to avoid drying out; please use either screw cap tubes or wrap the caps of each Eppendorf tube with parafilm.
- In order to avoid damage to the tubes during shipment, a tube storage box made of plastic or cardboard, and doubling it with a padded envelope, is recommended. Please avoid using round containers, such as 50 ml Corning tubes, for tube protection.
- Send samples to the following address:  
Asper Biotech  
Oru 3  
Tartu 51014  
Estonia  
Ph: +372 7 441 556
- Please fill in the DNA sample submission form (download the file from webpage) which improves and accelerates the handling of DNA samples and include it in the package.
- Notify us by email (info@asperbio.com, or the respective project manager), including the number of samples, which test is to be performed and tracking data).
- Enclose in the package the list of samples, which test is to be performed and quality data, if available.
- Please make sure that the declared value for the package in the shipment documents does not exceed 10 EUR (USD).

## FOR FURTHER INFORMATION

1. **Simultaneous multigene mutation detection in patients with sensorineural hearing loss through a novel diagnostic microarray: a new approach for newborn screening follow-up.**  
Gardner P, Oitmaa E, Messner A, Hoefsloot L, Metspalu A, Schrijver I. Pediatrics. 2006 Sep;118(3):985-94.
2. **Microarray-based mutation analysis of the ABCA4 (ABCR) gene in autosomal recessive cone-rod dystrophy and retinitis pigmentosa.**  
Klevering BJ, Yzer S, Rohrschneider K, Zonneveld M, Allikmets R, van den Born LI, Maugeri A, Hoyng CB, Cremers FPM. European Journal of Human Genetics (2004) 12, 1024-1032.
3. **Genotyping Microarray (Gene Chip) for the ABCR (ABCA4) Gene**  
K. Jaakson, J. Zernant, M. Kulm, A. Hutchinson, N. Tonisson, D. Glavaci, M. Ravnik-Glavaci, M. Hawlina, M.R. Meltzer, R.C. Caruso, F. Testa, A. Maugeri, C.B. Hoyng, P. Gouras, F. Simonelli, R.A. Lewis, J.R. Lupski, F.P.M. Cremers, and R. Allikmets Hum Mutat 2003, Vol. 22, pp. 395-403.
4. **Genotyping microarray (disease chip) for leber congenital amaurosis: detection of modifier alleles.**  
Zernant J, Kulm M, Dharmaraj S, den Hollander AI, Perrault I, Preising MN, Lorenz B, Kaplan J, Cremers FP, Maumenee I, Koenekoop RK, Allikmets R. Invest Ophthalmol Vis Sci. 2005 Sep;46(9):3052-9.
5. **Genotyping Microarray for the Detection of More Than 200 CFTR Mutations in Ethnically Diverse Populations.**  
Schrijver I, Oitmaa E, Metspalu A, Gardner P. J Mol Diagn. 2005 Aug;7(3):375-87
6. **Arrayed Primer Extension Resequencing of Mutations in the TP53 Tumor Suppressor Gene: Comparison with Denaturing HPLC and Direct Sequencing.**  
Le Calvez F, Ahman A, Tonisson N, Lambert J, Temam S, Brennan P, Zaridze DG, Metspalu A, Hainaut P, Clin Chem. 2005 Jul;51(7):1284-7.