Fairfax Cryobank
The Trusted Choice for Donor Sperm

Donor 2773

Genetic Testing Summary

Fairfax Cryobank recommends reviewing this genetic testing summary with your healthcare provider to determine suitability.

Last Updated: 06/24/19

Donor Reported Ancestry: German, Irish, Scottish, Polish Jewish Ancestry: No

Genetic Test*	Result	Comments/Donor's Residual Risk**
Chromosome analysis (karyotype)	Normal male karyotype	No evidence of clinically significant chromosome abnormalities
Hemoglobin evaluation	Normal hemoglobin fractionation and MCV/MCH results	Reduced risk to be a carrier for sickle cell anemia, beta thalassemia, alpha thalassemia trait (aa/-- and a-/a-) and other hemoglobinopathies
Cystic Fibrosis (CF) carrier screening	Negative by genotyping of 99 mutations.	1/310
Spinal Muscular Atrophy (SMA) carrier screening	Negative for deletions of exon 7 in the SMN1 gene	1/700
Tay Sachs Disease by enzyme analysis	Negative by Hexosaminidase enzyme analysis	
Sickle Cell Disease	Negative for 28 mutations tested in the HBB gene	<1/500
Beta Thalassemia	Negative for 27 mutations tested in the HBB gene	1/1500
Alpha-1-Antitrypsin Deficiency- see attached	Carrier: Z mutation in the SERPINA1 gene	Partner testing is indicated before use
Congenital Adrenal Hyperplasia due to 21-Hydroxylase Deficiency- see attached	Carrier: Non-Classic variant in the CYP21A2 gene	Partner testing is indicated before use

*No single test can screen for all genetic disorders. A negative screening result significantly reduces, but cannot eliminate, the risk for these conditions in a pregnancy.**Donor residual risk is the chance the donor is still a carrier after testing negative.

Counsyl

Results Recipient
Fair[redacted]ryobank - Fairfax
[redacted]
Report Date: 09/27/2011

Male
Name: DONOR 2773
DOB: [redacted]
Ethnicity: Northern European
Sample Type: EDTA Blood
Date of Collection: 09/16/2011
Barcode: [redacted]
Indication: Egg or Sperm Donor

[redacted]

Counsyl Test Results (Egg or Sperm Donor)

The Counsyl test uses targeted DNA mutation analysis to simultaneously determine the carrier status of an individual for a number of Mendelian diseases. This report indicates which mutations, if any, were detected for each mutation panel. Because only select mutations are tested, the percentage of carriers detected varies by ethnicity. A negative test result does not eliminate the possibility that the individual is a carrier. Interpretation is given as an estimate of the risk of conceiving a child affected with a disease, which is based on reported ethnicity, the test results, and an assumption of no family history.*

DONOR 2773

DONOR 2773's DNA test shows that he is not a carrier of any disease-causing mutation tested.

Partner

The reproductive risk presented is based on a hypothetical pairing with a partner of the same ethnic group.

Reproductive Risk Summary

No increased reproductive risks to highlight. Please refer to the following pages for detailed information about the results.

Clinical notes:

- Individuals of African, Southeast Asian, and Mediterranean ancestry are at increased risk for being carriers for hemoglobinopathies and may also benefit from carrier testing by CBC and hemoglobin electrophoresis or HPLC. *ACOG Practice Bulletin No. 78. Obstet Gynecol 2007;109:229-37.*

To schedule a free appointment to speak with a genetic counselor about your results, please visit www.counsyl.com/appointment.

* **Limitations:** In an unknown number of cases, nearby genetic variants may interfere with mutation detection. Other possible sources of diagnostic error include sample mix-up, trace contamination, and technical errors. The reproductive risk summary is provided as an aid to genetic counseling. Inaccurate reporting of ethnicity may cause errors in risk calculation.

Counsyl

Male

Name: DONOR 2773
DOB: [redacted]

Female

Not tested

Full Results

Below are the full test results for all diseases on the panel. Noted are the specific genetic mutations for which the patient tested positive or negative. If there was insufficient data to determine the genotype for any variant, this will be noted as "no call." Also listed in this section is the patient's post-test risk of being a carrier of each disease as well as the odds that his future children could inherit each disease.

✓ **Beta Thalassemia**

Reproductive risk: Less than 1 in 1,000,000

Risk before testing: 1 in 250,000

Reduced risk

DONOR 2773: No mutations detected. This does not rule out the possibility of being a carrier of untested mutations. The post-test risk of being a carrier, assuming a negative family history, is 1 in 1,500. 83% detection rate.

Gene: HBB. **Variants (27):** K17X, Q39X, Phe41fs, Ser9fs, IVS-II-654, IVS-II-745, IVS-II-850, IVS-I-6, IVS-I-110, IVS-I-5, IVS-I-1(G>A), -88C>T, -28A>G, -29A>G, Lys8fs, Phe71fs, IVS-II-849(A>C), IVS-II-849(A>G), Gly24 T>A, -87C>G, Hb C, W15X, Gly16fs, Glu6fs, Hb E, Hb D-Punjab, Hb O-Arab.

✓ **Cystic Fibrosis**

Reproductive risk: 1 in 34,000

Risk before testing: 1 in 3,000

Reduced risk

DONOR 2773: No mutations detected. This does not rule out the possibility of being a carrier of untested mutations. The post-test risk of being a carrier, assuming a negative family history, is 1 in 310. 91% detection rate.

Gene: CFTR. **Variants (99):** G85E, R117H, R334W, R347P, A455E, G542X, G551D, R553X, R560T, R1162X, W1282X, N1303K, F508del, I507del, 2184delA, 3659delC, 621+1G>T, 711+1G>T, 1717-1G>A, 1898+1G>A, 2789+5G>A, 3120+1G>A, 3849+10kbC>T, E60X, R75X, E92X, Y122X, G178R, R347H, Q493X, V520F, S549N, P574H, M1101K, D1152H, 2143delT, 394delTT, 444delA, 1078delT, 3876delA, 3905insT, 1812-1G>A, 3272-26A>G, 2183AA>G, S549R(A>C), R117C, L206W, G330X, T338I, R352Q, S364P, G480C, C524X, S549R(T>G), Q552X, A559T, G622D, R709X, K710X, R764X, Q890X, R1066C, W1089X, Y1092X, R1158X, S1196X, W1204X(c.3611G>A), Q1238X, S1251N, S1255X, 3199del6, 574delA, 663delT, 935delA, 936delTA, 1677delTA, 1949del84, 2043delG, 2055del9>A, 2108delA, 3171delC, 3667del4, 3791delC, 1288insTA, 2184insA, 2307insA, 2869insG, 296+12T>C, 405+1G>A, 405+3A>C, 406-1G>A, 711+5G>A, 712-1G>T, 1898+1G>T, 1898+5G>T, 3120G>A, 457TAT>G, 3849+4A>G, Q359K/T360K.

✓ **Sickle Cell Disease**

Reproductive risk: Less than 1 in 1,000,000

Risk before testing: less than 1 in 1,000,000

Reduced risk

DONOR 2773: No mutations detected. This does not rule out the possibility of being a carrier of untested mutations. The post-test risk of being a carrier, assuming a negative family history, is < 1 in 500. 70% detection rate.

Gene: HBB. **Variants (28):** Hb S, K17X, Q39X, Phe41fs, Ser9fs, IVS-II-654, IVS-II-745, IVS-II-850, IVS-I-6, IVS-I-110, IVS-I-5, IVS-I-1(G>A), -88C>T, -28A>G, -29A>G, Lys8fs, Phe71fs, IVS-II-849(A>C), IVS-II-849(A>G), Gly24 T>A, -87C>G, Hb C, W15X, Gly16fs, Glu6fs, Hb E, Hb D-Punjab, Hb O-Arab.

✓ **Spinal Muscular Atrophy**

Reproductive risk: 1 in 97,000

Risk before testing: 1 in 4,800

Reduced risk

DONOR 2773: No mutations detected. This does not rule out the possibility of being a carrier of untested mutations. The post-test risk of being a carrier, assuming a negative family history, is 1 in 700. 95% detection rate.

Gene: SMN1. **Variants (1):** Exon 7 deletion.

Recombine

CarrierMap™

Ordering Practice:	Donor 2773	Partner Not Tested
Practice Code: [redacted] Fairfax Cryobank [redacted] **Physician:** [redacted] **Report Generated:** 2016-01-20	**DOB:** [redacted] **Gender:** Male **Ethnicity:** European **Procedure ID:** 40651 **Kit Barcode:** [redacted] **Method:** Genotyping **Specimen:** Sperm, #42574 **Specimen Collection:** 2016-01-12 **Specimen Received:** 2016-01-13 **Specimen Analyzed:** 2016-01-20	

SUMMARY OF RESULTS

MUTATION(S) IDENTIFIED

Disease	Donor 2773	Partner Not Tested
Alpha-1-Antitrypsin Deficiency Moderate Impact	Carrier (1 abnormal copy) Mutation: c.G1096A (p.E366K) Gene: SERPINA1 Method: Genotyping Reproductive risk detected. Consider partner testing.	

All other mutations analyzed were not detected, reducing but not eliminating your chance to be a carrier for the associated genetic diseases. A list of all the diseases and mutations you were screened for is included later in this report. The test does not screen for every possible genetic disease.

For disease information, please visit www.recombine.com/diseases. To speak with a Genetic Counselor, call 855.OUR.GENES.

♂ Male

Panel: Custom Panel , Diseases Tested: 1, Mutations Tested: 4, Genes Tested: 1, Null Calls: 0

Assay performed by Reprogenetics
CLIA ID: 31D1054821
3 Regent Street, Livingston, NJ 07039
Lab Technician Bo Chu

Recombine CLIA # 31D2100763
Reviewed by Pere Colls, PhD, HCLD, Lab Director

This test was developed and its performance determined by Recombine Inc. and it has not been cleared or approved by the U.S. Food and Drug Administration.

Alpha-1-Antitrypsin Deficiency

Alpha-1 Antitrypsin Deficiency is an inherited condition that can cause lung and liver disease. This disease is caused by mutations in the SERPINA1 gene, which is normally responsible for producing alpha-1 antitrypsin protein. This protein controls the activity of the neutrophil elastase enzyme, which is released by white blood cells to fight infection. Without adequate alpha-1 antitrypsin, neutrophil elastase can damage healthy lung tissue. Abnormally formed alpha-1 antitrypsin can also accumulate in the liver, where it is produced, and damage liver tissue. Affected individuals develop lung disease between the ages of 20 and 50. The most common symptom is emphysema, a chronic condition caused by damage to the air sacs in the lungs that leads to coughing, difficulty breathing, and limits physical activity. A smaller proportion of affected patients also develop liver disease as children or as adults, leading to jaundice and sometimes liver failure.

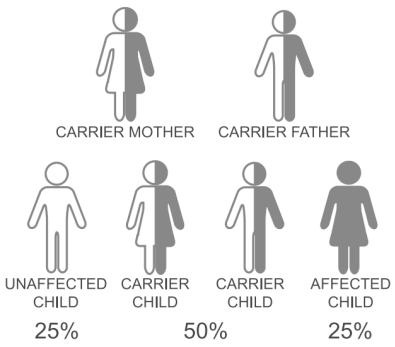
Moderate Impact

Status

Donor 2773:

Carrier (1 abnormal copy)
Mutation: c.G1096A (p.E366K)
Gene: SERPINA1
Method: Genotyping

Inheritance



Clinical Information

Physical Impairment	●
Cognitive Impairment	
Shortened Lifespan	
Effective Treatment	

Treatment

Lung transplantation or liver transplantation may be appropriate for patients with end-stage lung disease or liver disease due to Alpha-1-Antitrypsin Deficiency. In general, patients should avoid smoking. Vitamin E therapy has been demonstrated to improve liver function in symptomatic infants and may help prevent oxidative damage to the lungs.

Prognosis

Prognosis is generally favorable. Non-smokers often have a normal life span. Smoking, however, greatly accelerates the disease, particularly as it affects the lungs. Onset of lung disease typically occurs in adulthood. Liver disease presents in only 2% of affected children. Liver disease, however, affects about 19% of adults who live past 50 with this disease.

Carrier Risk Assessment

Ethnicity	Detection Rate	Pre-Test Risk	Post-Test Risk
European	95.00%	1/35	1/700
General	95.00%	Unknown	Unknown

To learn more visit http://recombine.com/diseases/alpha-1-antitrypsin-deficiency

Methods and Limitations

Genotyping: Genotyping is performed using the Illumina Infinium Custom HD Genotyping assay to identify mutations in >200 genes. The assay is not validated for homozygous mutations, and it is possible that individuals affected with disease may not be accurately genotyped.

Limitations: In some cases, genetic variations other than that which is being assayed may interfere with mutation detection, resulting in false-negative or false-positive results. Additional sources of error include, but are not limited to: sample contamination, sample mix-up, bone marrow transplantation, blood transfusions, and technical errors.

The test does not test for all forms of genetic disease, birth defects, and intellectual disability. All results should be interpreted in the context of family history; additional evaluation may be indicated based on a history of these conditions. Additional testing may be necessary to determine mutation phase in individuals identified to carry more than one mutation in the same gene. All mutations included within the genes assayed may not be detected, and additional testing may be appropriate for some individuals.

Diseases & Mutations Assayed

High Impact · Treatment Benefits · X-Linked · Moderate Impact

H	T	X	M	Disease	#	Mutations
○	○	○	●	Alpha-1-Antitrypsin Deficiency	4	♂ Genotyping | c.226_228delTTC (p.76delF), c.A1131T (p.L377F), c.C187T (p.R63C), c.G1096A (p.E366K)

SEND TO: QUEST DIAGNOSTICS BALTIMORE
ATTN: SEND OUTS
1900 SULPHUR SPRING ROAD
BALTIMORE, MD 21227

ALIGN HERE

Quest Diagnostics
Nichols Institute™
Quest Diagnostics Incorporated
33608 Ortega Hwy., San Juan Capistrano, CA 92675
CLIENT SERVICES - (800) 553-5446
Director: Jon Nakamoto, M.D., Ph. D.

PATIENT NAME	PATIENT ID NO.		DATE	TIME
2773, DONOR	[redacted]	COLLECTED	04/24/2014	06:35
[redacted] SEX: MALE	SAMPLE ID NO.: NOT GIVEN	OTHER ID NO.: [redacted]	RECEIVED	04/28/2014	04:03
REMARKS	REFERRING PHYSICIAN		REPORTED	05/06/2014	11:06
			STATUS	DUPLICATE	

TEST	RESULT (* = OUT OF RANGE)	UNITS	REFERENCE RANGE
CYP21A2	SEE BELOW		NEGATIVE

Note: The V281L mutation is usually associated with non-classic CAH so this individual is, at least, a heterozygous carrier of NC-CAH.
RESULT: POSITIVE FOR COMMON MUTATION(S) OF CYP21A2, THE 21-HYDROXYLASE GENE, BUT ONE COPY OF CYP21A2 IS NOT INTERRUPTED BY SUCH MUTATIONS.

Mutation(s) detected

Allele 1: V281L
Allele 2: None

INTERPRETATION: DNA testing indicates this individual is at least an unaffected carrier of CAH but the data do not identify evidence of 21-hydroxylase deficiency or CAH disease. Information DNA testing could be offered to members of this individual's family who are at risk to be affected by, or carriers of, CAH. If clinical suspicion for disease remains, additional studies such as complete sequencing of the CYP21A2 gene for rare mutations may be indicated.
Laboratory results and submitted clinical information reviewed by Michael Jarvis, Ph.D., ABMG, CGMB.

Congenital Adrenal Hyperplasia (CAH) due to 21-hydroxylase deficiency is an autosomal recessive disorder caused by mutations or genetic rearrangements that disrupt both parental copies of the gene for 21-hydroxylase, CYP21A2. About 90% of mutant chromosomes carry one or more of 10 common mutations detected in this assay. The mutations are detected by a mini-sequencing analysis of four different PCR products that allow inspection of the 21-hydroxylase gene, its pseudogene, and various recombinant forms of those genes. Mutations tested include P30L, Intron 2 "g", G110delGnt, I172N, Exon 6 cluster I236N, V237E and M239K, V281L, F306+1nt, Q318X, R356W, and P453S and the patterns observed can be used to deduce deletions plus recombination events between CYP21A2 and its pseudogene. Given 90% sensitivity for mutation detection, one would expect that no mutations would be identified in 10% of heterozygous carriers of CAH. Similarly, 18% of those affected by CAH should have a detectable mutation on a single parental chromosome and 1% of those with CAH should not have a detectable mutation on either parental chromosome. Since genetic variation and other problems can affect the accuracy of direct mutation detection, test results should always be interpreted in light of clinical and family data.

CYP21A2 genotypes can be complex and analysis of first degree relatives may be required to fully understand the haplotype or pattern of markers on an individual chromosome. Family studies should always be completed in preparation for prenatal diagnosis and genetic counseling may be useful to interpret either individual or family results.

This test is performed pursuant to a license agreement with Roche Molecular Systems, Inc. and Orchid Biosciences Inc.

This test was developed and its performance characteristics have been determined by Quest Diagnostics Nichols Institute, San Juan Capistrano. Performance characteristics refer to the analytical performance of the test.