UNITY

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POWERED BY Billion To One

PATIENT		SAMPLE		PROVIDER	
First Name	Jane	**Sample Type**	BLOOD	**Name**	Dr. Jane Smith
Last Name	Doe	**Date Collected**	05/03/2021	**Address**	1234 Street Name San Francisco, CA 94102
DOB	01/20/1986	**Date Received**	05/04/2021	**Phone**	555-555-5555
Ethnicity		**Accession ID**	123-45-6789	**Fax**	555-555-5555
Gender	Female	**Requisition ID**	987-65-4321		
Gestational Age	14w2d	**Date Reported**	05/11/2021		
Medical Record #	321-15-5321				

UNITY™ Complete: **Aneuploidy Screen**

Twin Gestation

SUMMARY OF RESULTS

LOW RISK FETUS

FEMALE FETAL SEX

FEMALE FETAL SEX

9.9% FETAL FRACTION

CONDITIONS SCREENED	FETAL RISK *by* NIPT	RISK *Before* NIPT	RISK *After* NIPT
Trisomy 21	**Low Risk**	**1 in 91**	**<1 in 10,000**
Trisomy 18	**Low Risk**	**1 in 288**	**<1 in 10,000**
Trisomy 13	**Low Risk**	**1 in 804**	**<1 in 10,000**

RECOMMENDED FOLLOW-UP

Genetic counseling is available to review the implications of this result.

The patient may contact BillionToOne at (650) 460-2551 to schedule an appointment for a complimentary telephone genetic consultation to review these results. A genetic counselor can also be found at www.nsgc.org.

UNITY™ Complete: **Rh(D)**

Twin Gestation

SUMMARY OF RESULTS

Rh- **NEGATIVE** FETAL Rh

RECOMMENDED FOLLOW-UP

ANTI-D PROPHYLAXIS is **NOT INDICATED** for this patient.

Interpretation *next page* ›

Patient Name Jane Doe	**DOB** 01/20/1986	**Gestational Age** 14w2d	**Medical Record #** 321-15-5321

INTERPRETATION

UNITY™ Complete: **Aneuploidy Screen**
Twin Gestation

The fetuses are LOW RISK to be affected with aneuploidy of chromosomes 13, 18, & 21.
The estimated fetal fraction was 9.9%

NIPT was performed to evaluate for fetal copy number of chromosomes 13, 18 & 21.

This NIPT result is valid only for a twin gestation achieved without egg donation or gestational carrier.

A low risk NIPT result significantly reduces the risk of the screened aneuploidies; it does not eliminate the risk. NIPT does not exclude abnormalities of other chromosomes not evaluated by the screen, microdeletions, triploidy, other genetic syndromes, or birth defects. A low risk NIPT result does not guarantee a normal pregnancy outcome.

Genetic counseling is available for this patient to review the implications of this result. The patient may contact BillionToOne at (650) 460-2551 to schedule an appointment for a complimentary telephone genetic consultation to review these results. Comprehensive genetic counseling is recommended for a patient with a family history of a chromosome abnormality or other genetic disorder so that risks can be accurately discussed, as well as additional testing options that may be available. A genetic counselor can also be found at www.nsgc.org.

UNITY™ Complete: **Rh(D)**
Twin Gestation

The fetuses are NEGATIVE for RhD. The estimated fetal fraction was 9.9%

NIPT was performed to evaluate for fetal Rh status. No copies of a functioning *RHD* gene were detected in the cell-free DNA. Therefore, the fetuses are RhD negative.

Anti-D prophylaxis is not indicated for this patient.

This NIPT result is valid only for a twin gestation achieved without egg donation or gestational carrier.

METHODS AND LIMITATIONS

UNITY™ Complete: **Aneuploidy Screen**

Cell-free DNA (cfDNA) was isolated from 2-4 mL of plasma from whole blood collected in a Streck cell-free DNA tube. A paternal inheritance NIPT was performed as a multiplex PCR on common single nucleotide variants (SNVs) to measure the fraction of cell-free DNA of fetal origin. A modified fetal fraction calculation is performed for twin pregnancies and pregnancies conceived with a gestational carrier. The fetal risk for aneuploidy of chromosomes 13, 18, 21, X, & Y for singleton pregnancies or chromosomes 13, 18, & 21 for twin pregnancies, was determined by a separate multiplex PCR on cfDNA using no more than 99 amplicons per chromosome to perform relative chromosomal dosage analysis. When multiple blood tubes are analyzed for NIPT (e.g. for redraws), we report the combined reported fetal fraction by taking the arithmetic mean of fetal fractions across different tubes. Due to the tube-to-tube assay variability, the reported fetal fraction for the same patient can differ between single-gene NIPT and aneuploidy NIPT. Post-test residual risks ('Risk After NIPT') for high-risk results are calculated based on the test sensitivity, test specificity, and prior risks as determined by maternal age and are therefore personalized. Post-test residual risks for low-risk results are calculated based on the test sensitivity, test specificity, and prior risk in the general population, and are therefore not personalized.

Test Limitations: Results may not be reported when the amount of cell-free fetal DNA in the blood sample is too low. Results from this test are highly accurate; however, discordant results may occur. Potential causes of discordant results include: maternal, fetal, or placental mosaicism, low fetal fraction, vanishing twin, maternal malignancy, maternal organ or bone marrow transplant, or other reasons. Findings of unknown significance will not be reported. UNITY™ does not screen for neural tube defects or abdominal wall defects. This test does not screen for microdeletions. UNITY™ NIPT is not diagnostic. No irreversible decisions regarding the pregnancy should be made without confirmatory invasive prenatal testing.

CONDITIONS SCREENED	SENSITIVITY	SPECIFICITY	POSITIVE PREDICTIVE VALUE	NEGATIVE PREDICTIVE VALUE
Trisomy 21	99.8% [98.9% - 100%]	99.9% [99.8% - 99.9%]	84.2%	> 99.9%
Trisomy 18	99.9% [99.0% - 100%]	> 99.9% [99.9% - 100%]	94.2%	> 99.9%
Trisomy 13	99.1% [97.4% - 100%]	> 99.9% [99.9% - 100%]	52.5%	> 99.9%
Monosomy X	97.7% [93.7% - 100%]	> 99.9% [99.9% - 100%]	85.5%	> 99.9%
Sex Chromosome Aneuploidy (XXX / XXY / XYY)	Reported when identified	> 99.9%	n/a	> 99.9%
Presence of Y Chromosome	> 99.9%	> 99.9%	n/a	> 99.9%

** Internal analytical validation data for singleton pregnancies. Performance metrics are estimated based on analytical data from contrived aneuploidy samples at 9% fetal fraction. Representative coefficients of variance from human plasma samples were applied to this analytical data to perform Monte Carlo simulations to calculate these metrics, assuming prior risks for a patient population of advanced maternal age. Mosaicism is not reflected in the validation.*

METHODS AND LIMITATIONS

UNITY™ Complete: **Rh(D)**

Cell-free DNA (cfDNA) was isolated from 2-4mL of plasma from whole blood collected in a Streck cell-free DNA tube. The resulting DNA was subjected to a Custom Amplicon Panel PCR with proprietary Quantitative Counting Template molecules. The amplified DNA was sequenced by synthesis on an Illumina MiSeq. Results were aligned and examined on a custom bioinformatics pipeline and compared to the published human genome build GRCh37/hg19 reference sequence along with the sequence of *RHDpsi*. A modified fetal fraction calculation is performed for twin pregnancies and pregnancies conceived with a gestational carrier.

Paternal alleles present in common single nucleotide variants (SNVs) were used to measure the fraction of cell-free DNA of fetal origin. Quantitative Counting Templates were used to determine the presence or absence of molecules of the *RHD* gene and the *RHDpsi* variant in the cell-free DNA.

Test Limitations: The RhD NIPT may not be reported when the amount of cell-free fetal DNA in the blood sample is too low. RhD pseudogenes not mentioned above may not be able to be differentiated from RhD and may be reported as RhD positive. Positive RhD results are returned for RhD positive mothers, due to the presence of maternal RhD in the cell-free DNA.

MATERNAL PHENOTYPE	FETAL PHENOTYPE	FETAL GENOTYPE	UNITY™ FETAL Rh(D) NIPT RESULT	CLINICAL ACTION
Rh negative	Rh negative	*RHD* gene deletion	negative	Anti-D prophylaxis is not indicated
	Rh negative	*RHD* psi	negative	
	Rh negative	*RHD-CE-D* hybrid	negative	
	Rh negative	*RHD* rare mutation	likely positive	Anti-D prophylaxis is indicated
	Rh weak D	weak D type 1, 2, 3, etc.	likely positive	
	Rh negative	*RHD* gene present	likely positive	
Rh weak D	Rh negative or positive	n/a	likely positive	If maternal RhD-genotyping is not performed, Anti-D prophylaxis is indicated
Rh positive	Rh negative or positive	n/a	likely positive	Anti-D prophylaxis is not indicated

This NIPT was developed and its performance characteristics determined by the BillionToOne laboratory. It has not been cleared or approved by the U.S. Food and Drug Administration. The BillionToOne laboratory is regulated under CLIA. This test is used for clinical purposes. It should not be regarded as investigational or for research.

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UNITY™ ANEUPLOIDY SCREEN – LOW RISK FETUS

UNITY™ ANEUPLOIDY SCREEN

Non-invasive prenatal testing (NIPT) through UNITY™ screens for specific chromosome changes called aneuploidy. The average person has 23 pairs of chromosomes, or 46 chromosomes total, with one of each chromosome inherited from each parent. A person with aneuploidy has an extra or missing copy of a chromosome, which may cause them to have health problems, physical birth defects, and/or developmental delays. The type and severity of symptoms vary depending on which chromosome is extra or missing. Any woman can have a baby born with a chromosome change. Most aneuploidy is not inherited.

UNITY™ screens for some of the most common aneuploidies present at birth

- Trisomy 21 (Down syndrome)
- Trisomy 18 (Edwards syndrome)
- Trisomy 13 (Patau syndrome)

YOUR PREGNANCY'S RISK: LOW RISK

The testing performed by UNITY™ shows a very low chance that your babies have the conditions screened.

Because UNITY™ is a screen, and not diagnostic, a low risk result significantly reduces but does not completely eliminate the chance of the baby having aneuploidy. UNITY™ cannot guarantee a healthy baby. Additional screening and testing remain available, should you desire more information, such as ultrasound or prenatal diagnostic testing (such as chorionic villus sampling or amniocentesis).

Genetic counseling is available to discuss these results. If you have questions, you may contact BillionToOne at (650) 460-2551 to schedule an appointment for a complimentary telephone genetic consultation to review these results. A local genetic counselor can also be found at www.nsgc.org

RESOURCES

- **National Society of Genetic Counselors -** https://www.nsgc.org/
- **American College of Obstetricians and Gynecologists Guide to Prenatal Diagnosis -** https://www.acog.org/Patients/FAQs/Prenatal-Genetic-Diagnostic-Tests?IsMobileSet=false