



# Newborn Screening Quality Assurance Program

## PROFICIENCY TESTING

## Cystic Fibrosis Mutation Detection Quarterly Report

Volume 6, No. 3

August 2012

### INTRODUCTION

This report is the quarterly summary of all data reported within the specified data-reporting period for the Quarter 3, 2012 program for cystic fibrosis (CF) mutation detection. The attached tables provide the certification profiles for the distributed specimens, the verification of your reported data, the summary of reported genotypes, and the frequency distribution summary for expected interpretations. We distribute this PT report to all participants, state laboratory directors, and program colleagues by request.

On July 9, 2012 a panel of five unknown dried-blood-spot (DBS) specimens was distributed to 33 laboratories in the United States and 33 laboratories in other countries to detect mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene.

### PARTICIPANT RESULTS

This panel consisted of five DBS specimens prepared from adult CF patients, carriers or unaffected individuals (specimens 312C1, 312C2, 312C3, 312C4, and 312C5).

Evaluations are based on the clinical assessment of each specimen. Expected genotypes may differ by participant because of the panel of mutations tested. In these cases, an answer of “no mutation detected” is acceptable. A specimen is considered not evaluated when both of the expected mutations are not detected by the laboratory’s method or if the specimen cannot be assayed (sample failure).

We processed data from 57 participants. Laboratories were asked to report the method used and the genotype for each specimen. Methods varied widely with regard to the panel of mutations detected and the algorithm used for testing.

The specific methods and the number of laboratories that use them are shown in the Laboratory Methods Table. Some laboratories screen specimens for a limited number of mutations and if a mutation was present, continue testing with an expanded panel. Laboratories were not asked to report the maximum number of mutations that could be detected.

No incorrect clinical assessments were reported. Sample failure was reported for specimens 312C4 and 312C5. The Newborn Screening Quality Assurance Program will ship next quarter’s Cystic Fibrosis Mutation Detection PT specimens on October 1, 2012.

### ACKNOWLEDGMENTS

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CDC/APHL

This program is cosponsored by the Centers for Disease Control and Prevention (CDC)  
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Direct inquiries to:  
Centers for Disease Control and Prevention (CDC)  
4770 Buford Highway, NE, MS/F43  
Atlanta, GA 30341-3724

Phone: 770-488-7828  
FAX: 770-488-4255  
E-mail: MEarley@cdc.gov

Editor: Marie Earley  
Production: Connie Singleton



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CYSTIC FIBROSIS MUTATION DETECTION SURVEY

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FREQUENCY OF REPORTED CLINICAL ASSESSMENTS

Specimen	Screen Negative (Normal)	Screen Positive (1 or 2 mutations detected)	Sample Failure
312C1	57	0	0
312C2	0	57	0
312C3	0	57	0
312C4	55	0	2
312C5	55	0	2

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 LABORATORY METHODS

Method	Number of Laboratories
65 Abbott Molecular CF Genotyping Assay (DNA)	4
55 Hologic Inplex Assay	21
44 Luminex Molecular Diagnostics CFTR IVD	11
41 Innogenetics Inno-LIPA	4
37 Gen-probe Elucigene (ARMS)	4
19 Other *	14

* Other Methods Include:
Allele-specific oligonucleotide PCR
Amplification / gel electrophoresis
Autogenomics INFINITI® CFTR-15 Assay
High Resolution Melt Technology
In-house ARMS assay
In-house assay
Matrix Assisted Laser Desorption /Ionization- Time Of Flight (MALDI-TOF) mass spectrometry
Modified Luminex-based assay
PCR/Restriction fragment length polymorphism analysis
Real-time allelic discrimination assay (i.e. TaqMan assay)
Sequencing

Some laboratories report more than one method.

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SPECIMEN CERTIFICATION

Specimen	Allele 1	Allele 2	Expected Clinical Assessment
312C1*	Wild type	Wild type	1
312C2	F508del (p.Phe508del)	G542X (p.Gly542X)	2
312C3	711+1G->T (c.579+1G->T)	F508del (p.Phe508del)	2
312C4	Wild type	Wild type	1
312C5	Wild type	Wild type	1

1 = screen negative (normal)

2 = 1 or 2 mutations detected

3 = Sample failure

Alleles were determined/confirmed by CDC and/or were included with the samples from the provider.

\*Specimen 312C1 has 1 allele with a large deletion that is not detected by any of the methods currently used by our participants. Therefore, the expected clinical assessment is "Screen Negative".

This **NEWBORN SCREENING QUALITY ASSURANCE PROGRAM** report is an internal publication distributed to program participants and selected program colleagues. The laboratory quality assurance program is a project cosponsored by the **Centers for Disease Control and Prevention (CDC)** and the **Association of Public Health Laboratories**.

**CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)**  
**ATLANTA, GA 30341**

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**Chief**

**Newborn Screening and Molecular Biology Branch**

Carla Cuthbert, Ph.D.



**Contributors:** Barbara W. Adam  
Carol Bell  
Dana Chafin  
Paul Dantonio  
Victor R. De Jesus, Ph.D.  
Marie C. Earley, Ph.D.  
Sharon Flores  
Elizabeth M. Hall  
Christopher Haynes, Ph.D.  
Kevin Lanza  
Francis Lee, Ph.D.  
Lixia Li, Ph.D.  
Timothy Lim, Ph.D.  
Daniel Mandel, Ph.D.  
Joanne Mei, Ph.D.  
Nancy Meredith  
Tracey Myers  
Kelsey Sheard  
Jennifer Taylor, Ph.D.  
Robert Vogt, Ph.D.  
Irene Williams  
Golriz Yazdanpanah  
Hui Zhou, Ph.D.  
Sherri Zobel

**Production:** Sarah Brown  
Felicia Manning  
Teresa Moore  
Connie Singleton



**ASSOCIATION OF PUBLIC HEALTH LABORATORIES**  
**SILVER SPRING, MD 20910**

**President**

Charles Brokopp, Dr. P.H., M.P.H.

**Chairman, Newborn Screening and Genetics in Public Health Committee**

Susan M. Tanksley, Ph.D.

**Chairman, Newborn Screening Quality Assurance Quality Control Subcommittee**

Patrick Hopkin, B.S.

**INQUIRIES TO:**

*Marie Earley, Editor* • *Centers for Disease Control and Prevention (CDC)*  
*Newborn Screening Quality Assurance Program* • *Mailstop F-43*  
*4770 Buford Highway, N.E.* • *Atlanta, GA 30341-3724*  
*Phone (770) 488-4582* • *FAX (770) 488-4255* • *E-mail: MEarley@cdc.gov*