



# Newborn Screening Quality Assurance Program

## PROFICIENCY TESTING

## Cystic Fibrosis Mutation Detection Quarterly Report

Volume 5, No. 3

September 2011

### INTRODUCTION

This report is the quarterly summary of all data reported within the specified data-reporting period for the Quarter 3, 2011, 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 distributions summary for expected interpretations. We distribute this proficiency testing (PT) report to all participants, state laboratory directors, and program colleagues by request.

On July 11, 2011, a panel of five unknown dried-blood-spot (DBS) specimens was distributed to 29 laboratories in the United States and 28 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 31C1, 31C2, 31C3, 31C4, and 31C5).

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 one or both of the expected mutations is not detected by the laboratory's method or if the specimen cannot be assayed (sample failure).

We processed data from 55 participants. Laboratories were asked to report 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. One laboratory screened specimens for four mutations and if a mutation was present, continued testing with an expanded panel. Laboratories were not asked to report the maximum number of mutations that could be detected.

Six incorrect clinical assessments were reported among specimens 31C1, 31C2, 31C3, and 31C5; one was assessed as a false positive and others were assessed as false negative. One sample failure was reported for specimen 31C2. Three laboratories did not report data this quarter. The Newborn Screening Quality Assurance Program will ship next quarter's Cystic Fibrosis Mutation Detection PT specimens on October 3, 2011.

### ACKNOWLEDGMENTS

We would like to thank Philip Farrell, M.D., Ph.D. (University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin) and the collection centers for their collaboration and efforts in this project. We would also like to thank the blood donors for participating. Without their contributions, this program would not be possible. ❖

CDC/APHL

This program is cosponsored by the Centers for Disease Control and Prevention (CDC) and the Association of Public Health Laboratories (APHL).

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NEWBORN SCREENING QUALITY ASSURANCE PROGRAM

CYSTIC FIBROSIS MUTATION DETECTION SURVEY

QUARTER 3 – SEPTEMBER 2011

LAB XXX

DATA VERIFICATION

Specimen Number	Allele 1	Allele 2	Clinical Assessment
31C1			
31C2			
31C3			
31C4			
31C5			

Reviewer's Comments

EVALUATION:

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FREQUENCY OF REPORTED CLINICAL ASSESSMENTS

Specimen	Screen Negative (Normal)	Likely Cystic Fibrosis Positive	Likely Cystic Fibrosis Carrier	Sample Failure
31C1*	0	51	3	0
31C2	53	0	1	1
31C3*	1	39	14	0
31C4*	0	40	14	0
31C5*	1	11	42	0

\*One laboratory does not distinguish between a likely carrier and a likely positive due to the method used and these results are not included in this table.

INCORRECT ASSESSMENTS AND SPECIMENS NOT EVALUATED

Specimen	Incorrect Assessment	Not Evaluated
31C1	3	0
31C2	1	1
31C3	1	14
31C4	0	14
31C5	1	42

\* This table includes the data not included in the Frequency of Reported Clinical Assessments table above.

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LABORATORY METHODS

Method	Number of Laboratories
Hologic (Third Wave Technologies) Invader Assay	19
Luminex Molecular Diagnostics X-Tag Cystic Fibrosis kit	9
Gen-Probe Elucigene Assay (CF-29, CF-30, CF-4, or CF-EU)	5*
Innogenetics Inno-LIPA	5
Abbott Laboratories	4
Real-time allelic discrimination assay	3
PCR/Restriction fragment length polymorphism analysis	3*
Amplification / gel electrophoresis	3*
Sequencing	1*
In-house SNP assay	1
Allele-specific oligonucleotide PCR	1
Matrix Assisted Laser Desorption /Ionization- Time Of Flight (MALDI-TOF) mass spectrometry	1
Autogenomics INFINITI® CFTR-15 Assay	1
High Resolution Melt Technology	1
Not reported	1

\*Assays used in addition to another method listed.

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SPECIMEN CERTIFICATION

Specimen	Allele 1 (Colloquial name)	Allele 2 (Colloquial name)	Allele 1 (Standard name)	Allele 2 (Standard name)	Expected Clinical Assessment
31C1	F508del	F508del	p.Phe508del	p.Phe508del	2
31C2	Wild type	Wild type	Wild type	Wild type	1
31C3	F508del	2789+5G→A	p.Phe508del	c.2657+5A→G	2
31C4	R560T	F508del	p.Arg560Thr	p.Phe508del	2
31C5	F508del	3272-26A→G	p.Phe508del	c.3140-26A→G	2

1 = screen negative (normal) 2 = likely cystic fibrosis positive 3 = likely cystic fibrosis carrier

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

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**.

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