Product Information and Testing - Amended

Product Information

Product Name	WA09
Alias	H9
Lot Number	WB0139
Parent Material	WA09-MCB-01
Depositor	University of Wisconsin – Laboratory of Dr. James Thomson
Banked by	WiCell
Thaw Recommendation	Thaw 1 vial into 1 well of a 6 well plate.
Culture Platform	Feeder Dependent Medium: hES Medium Matrix: MEF
Protocol	WiCell Feeder Dependent Protocol
Passage Number	p24 These cells were cultured for 23 passages prior to freeze, 4 of them (p18-21) in mTeSR1/Matrigel. WiCell adds +1 to the passage number at freeze so that the number on the vial best represents the overall passage number of the cells at thaw.
Date Vialed	20-April-2012
Vial Label	WB0139 WA09 p24 LK 20APR12
Biosafety and Use Information	Appropriate biosafety precautions should be followed when working with these cells. The end user is responsible for ensuring that the cells are handled and stored in an appropriate manner. WiCell is not responsible for damages or injuries that may result from the use of these cells. Cells distributed by WiCell are intended for research purposes only and are not intended for use in humans.

Testing Performed by WiCell

Test Description	Test Provider	Test Method	Test Specification	Result
Post-Thaw Viable Cell Recovery	WiCell	SOP-CH-305	≥ 15 Undifferentiated Colonies, ≤ 30% Differentiation	Pass
Identity by STR	UW Molecular Diagnostics Laboratory	PowerPlex 1.2 System by Promega	Consistent with known profile	Pass
Sterility - Direct transfer method	Apptec	30744	Negative	Pass
Mycoplasma	Bionique	M250	No contamination detected	Pass
Karyotype by G-banding	WiCell	SOP-CH-003	Normal karyotype	Pass

Amendment(s):

Reason for Amendment	Date
CoA updated for format changes, including adding fields of thaw recommendation, vial label, protocol, and banked by, and removal of footnotes.	See Signature
Original CoA	20-JUL-2012

Date of Lot Release	Quality Assurance Approval
20-July-2012	1/3/2014 X AMC AMC Quality Assurance Signed by: [redacted]

UW Health

University of Wisconsin
Hospital and Clinics

Histocompatibility/Molecular Diagnostics Laboratory

[redacted]

Short Tandem Repeat Analysis*

Sample Report: 10503-STR Label on the tube: 10503-STR Sample Date: 06/22/12
Received Date: 06/22/12

Requestor: WiCell Research Institute
Test Date: 07/03/12 File Name: 120703 SLE Report Date: 07/06/12

Sample Name: (label on tube) **10503-STR**

Description: DNA Extracted by WiCell
252 ug/mL; 260/280 = 1.89

Locus	Repeat #	STR Genotype
D16S539	5, 8-15	12,13
D7S820	6-14	9,11
D13S317	7-15	9,9
D5S818	7-15	11,12
CSF1PO	6-15	11,11
TPOX	6-13	10,11
Amelogenin	NA	X,X
TH01	5-11	9.3,9.3
vWA	11, 13-21	17,17

Comments: Based on the DNA 10503-STR dated and received on 06/22/12 from WI Cell, this sample (Label on tube: 10503-STR) matches exactly the STR profile of the human stem cell line WA09 (H9) comprising 12 allelic polymorphisms across the 8 STR loci analyzed. No STR polymorphisms other than those corresponding to the human WA09 (H9) stem cell line were detected and the concentration of DNA required to achieve an acceptable STR genotype (signal/noise) was equivalent to that required for the standard procedure (~1 ng/amplification reaction) from human genomic DNA. These results suggest that the 10503-STR DNA sample submitted corresponds to the WA09 (H9) stem cell line and it was not contaminated with any other human stem cells or a significant amount of mouse feeder layer cells. Sensitivity limits for detection of STR polymorphisms unique to either this or other human stem cell lines is estimated to be ~5%.

[redacted] 7/9/12
Date
Molecular Diagnostics Laboratory

[redacted] 07/06/12
Date
Molecular Diagnostics Laboratory

* Testing to assess engraftment following bone marrow transplantation was accomplished by analysis of human genetic polymorphisms at STR loci. This methodology has not yet been approved by the FDA and is for investigational use only.

File: Final STR Report

Test Facility:
[redacted]

WuXi AppTec

Report Number
900594
Page 1 of 1

WiCell Research Institute
[redacted]

June 12, 2012
P.O. #: [redacted]

STERILITY TEST REPORT

Sample Information: Stem Cells

1: WA27-WB0130 10504
2: WA26-WB0131 10505
3: WA25-WB0132 10506
4: WA25-WB0127 10507
5: WA26-WB0128 10508
6: WA27-WB0138 10509
7: WA26-WB0152 10514
8: WA25-WB0151 10512
9: WA09-WB0143 10521
10: WA09-WB0139 10520
11: WA27-WB0150 10522
12: H9 hOct4-pGZ-WB0140 10518
13: MIRJT6i-mND1-4-WB0142.10519

Date Received: May 23, 2012
Date in Test: May 29, 2012
Date Completed: June 12, 2012

Test Information: Test Codes: 30744, 30744A
Immersion, USP / 21 CFR 610.12
Procedure #: BS210WCR.201

TEST PARAMETERS	PRODUCT	
Approximate Volume Tested	0.5 mL	0.5 mL
Number Tested	26	26
Type of Media	SCD	FTM
Media Volume	400 mL	400 mL
Incubation Period	14 Days	14 Days
Incubation Temperature	20 °C to 25 °C	30 °C to 35 °C
RESULTS	26 NEGATIVE	26 NEGATIVE

[redacted] 06-13-12
QA Reviewer **Date**

[redacted] 06-13-12
Technical Reviewer **Date**

Testing conducted in accordance with current Good Manufacturing Practices.

[redacted]

bionique Testing Laboratories

MYCOPLASMA TESTING SERVICES

BIONIQUE® TESTING LABORATORIES, INC.
[redacted]

APPENDIX

Document ID #:	DCF9002F
Title:	QUALITY ASSURANCE REPORT - GMP
Effective Date:	11/2/11
Edition #:	03

QUALITY ASSURANCE REPORT – GMP

TEST PERFORMED	PROCEDURAL REFERENCE	TEST PERFORMED	PROCEDURAL REFERENCE
☒ M-250	SOP's 3008, 3011, 3013	☐ M-700	SOP's 3008, 3009, 3010
☐ M-300	SOP's 3008, 3014	☐ M-800	SOP's 3008, 3011, 3016
☐ M-350	SOP's 3008, 3014, 3015		

Bionique Sample ID #(s) 70432

This testing procedure was performed in compliance with the FDA's Current Good Manufacturing Practice (cGMP) standards (to the extent that the regulations pertain to the procedures performed) as specified in the Code of Federal Regulations, Title 21 Parts 210 and 211 [21 CFR 210 & 211]. All related records derived from the test procedures have been reviewed by the Quality Assurance Department. The individual's signature below verifies that the methods and procedures referenced above have been followed and that the Final Report accurately reflects the raw data generated during the course of the procedures. All records, including raw data and final reports are archived on site for a minimum of seven years.

The specified test's procedures determine the intervals at which samples are inspected. The medium used for testing must pass quality control mycoplasmal growth promotion testing and sterility testing. Traceability of all of the components used is assured and supporting documentation can be supplied upon request.

Quality Assurance Review Date: 7/18/12

Reviewed By [redacted] QA Assistant [redacted]

NOTE:

1. Prior to receipt at Bionique® Testing Laboratories, Inc., the stability of the test article is the responsibility of the company submitting the sample. Bionique Testing Laboratories Inc. will assume responsibility for sample stability following receipt and prior to being placed on test.
2. This test is for the detection of microbiological growth and does not require statistical validation.

REFERENCES

Regulatory:

1. Department of Health and Human Services, Food and Drug Administration (USA) [FDA]. Code of Federal Regulations [CFR], Title 21 CFR Part 210, Current Good Manufacturing Practice in Manufacturing, Processing, Packing, or Holding of Drugs; General. FDA. Office of the Federal Register, National Archives and Records Department.
2. Department of Health and Human Services, Food and Drug Administration (USA) [FDA]. Code of Federal Regulations [CFR], Title 21 CFR Part 211, Current Good Manufacturing Practice for Finished Pharmaceuticals. FDA. Office of the Federal Register, National Archives and Records Department.
3. Department of Health and Human Services, Food and Drug Administration (USA) [FDA]. Points to Consider in the Characterization of Cell Lines Used to Produce Biologicals, Director, Center for Biologics Evaluation and Research, FDA. May, 1993. Docket No. 84N-0154.
4. Department of Health and Human Services, Food and Drug Administration (USA) [FDA]. Code of Federal Regulations [CFR], Title 21 CFR Part 610.30, General Biological Products Standards; Subpart D, Test for Mycoplasma. FDA. Office of the Federal Register, National Archives and Records Department.

General:

1. Barile MF, Kern J. Isolation of Mycoplasma arginini from commercial bovine sera and its implication in contaminated cell cultures. Proceedings of the Society for Experimental Biology and Medicine, Volume 138, Number 2, November 1971.
2. Chen, T.R. In situ detection of mycoplasma contamination in cell cultures by fluorescent Hoechst 33258 stain. Experimental Cell Research, 104: 255-262, 1977.
3. Carolyn K. Lincoln and Daniel J. Lundin. Mycoplasma Detection and Control. U. S. Fed. for Culture Collections Newsletter, Vol. 20, Number 4, 1990.
4. Fetal Bovine Serum; Proposed Guideline. National Committee For Clinical Laboratory Standards (NCCLS), Vol. 10, Number 6, 1990. (NCCLS publication M25-P).
5. McGarrity GJ, Sarama J, Vanaman V. Cell Culture Techniques. ASM News, Vol. 51, No. 4, 1985.
6. Tully JG, Razin S. Methods in Mycoplasmology, Volumes I and II. Academic Press, N.Y., 1983.
7. Barile MF, Razin S, Tully JG, Whitcomb RF. The Mycoplasmas, Volumes 1-4. Academic Press, N.Y., 1979.
8. http://www.bionique.com/ - Safe Cells Insights

bionique Testing Laboratories

MYCOPLASMA TESTING SERVICES

BIONIQUE TESTING LABORATORIES, INC
[redacted]

APPENDIX IV

Document#: DCF3013D
Edition#: 10
Effective Date: 07/15/2003
Title: **M-250 FINAL REPORT SHEET**

M-250 FINAL REPORT

Direct Specimen Culture
Procedure 3008, 3011, 3013

TO: **WiCell QA**
WiCell Research Institute
[redacted]

BTL SAMPLE ID#: **70432** P.O.#: [redacted] DATE REC'D: **06/20/2012**

TEST/CONTROL ARTICLE:

WA09-WB0139 #10503

LOT#: **NA**

DIRECT CULTURE SET-UP (DAY 0) DATE: **06/20/2012**

INDICATOR CELL LINE (VERO) SEE DNA FLUOROCHROME RECORD SHEET

			DATE
THIOGLYCOLLATE BROTH	DAY 7	+ ⊖	06/27/2012
	DAY 28	+ ⊖	07/18/2012
BROTH-FORTIFIED COMMERCIAL			
0.5 mL SAMPLE	DAY 7	+ ⊖	06/27/2012
6.0 mL BROTH	DAY 28	+ ⊖	07/18/2012
BROTH-MODIFIED HAYFLICK			
0.5 mL SAMPLE	DAY 7	+ ⊖	06/27/2012
6.0 mL BROTH	DAY 28	+ ⊖	07/18/2012
BROTH-HEART INFUSION			
0.5 mL SAMPLE	DAY 7	+ ⊖	06/27/2012
6.0 mL BROTH	DAY 28	+ ⊖	07/18/2012

(See Reverse)

Document#: DCF3013D
Edition#: 10
Effective Date: 07/15/2003
Title: M-250 FINAL REPORT SHEET

SAMPLE ID#: **70432**		AEROBIC	MICROAEROPHILIC	DATE
AGAR PLATES-FORTIFIED COMMERCIAL	DAY 7	+ ⊖	+ ⊖	06/27/2012
	DAY 14	+ ⊖	+ ⊖	07/04/2012
	DAY 21	+ ⊖	+ ⊖	07/11/2012
AGAR PLATES-MODIFIED HAYFLICK	DAY 7	+ ⊖	+ ⊖	06/27/2012
	DAY 14	+ ⊖	+ ⊖	07/04/2012
	DAY 21	+ ⊖	+ ⊖	07/11/2012
AGAR PLATES-HEART INFUSION	DAY 7	+ ⊖	+ ⊖	06/27/2012
	DAY 14	+ ⊖	+ ⊖	07/04/2012
	DAY 21	+ ⊖	+ ⊖	07/11/2012
BROTH SUBCULTURES (DAY 7)		DATE: 06/27/2012		
AGAR PLATES-FORTIFIED COMMERCIAL	DAY 7	+ ⊖	+ ⊖	07/04/2012
	DAY 14	+ ⊖	+ ⊖	07/11/2012
	DAY 21	+ ⊖	+ ⊖	07/18/2012
AGAR PLATES-MODIFIED HAYFLICK	DAY 7	+ ⊖	+ ⊖	07/04/2012
	DAY 14	+ ⊖	+ ⊖	07/11/2012
	DAY 21	+ ⊖	+ ⊖	07/18/2012
AGAR PLATES-HEART INFUSION	DAY 7	+ ⊖	+ ⊖	07/04/2012
	DAY 14	+ ⊖	+ ⊖	07/11/2012
	DAY 21	+ ⊖	+ ⊖	07/18/2012

RESULTS: No detectable mycoplasmal contamination

7/18/12
Date

[redacted]

ADDITIONAL COMMENTS:

M-250 Procedural Summary: The objective of this test is to ascertain whether or not detectable mycoplasmas are present in an in vitro cell culture sample, be it a primary culture, hybridoma, master seed stock or cell line. This procedure combines an indirect DNA staining approach to detect non-cultivable mycoplasmas with a direct culture methodology utilizing three different mycoplasmal media formulations. The indirect approach involves the inoculation of the sample into a mycoplasma-free VERO (ATCC) indicator cell line and performing a DNA fluorochrome assay after 72-120 hours of incubation. The direct culture aspect of the test utilizes three different mycoplasmal media including both broth and agar formulations. The sample is inoculated into each of the 3 broth formulations and also onto duplicate plates (0.1 mL/plate) for each of the 3 agar formulations. Subculture from broth to fresh agar plates is carried out after 7 days incubation. Agar plates are incubated aerobically and microaerophillically in order to detect any colony forming units morphologically indicative of mycoplasmal contamination. Issuance of the final report with signature of the Laboratory Director signifies that the required controls were performed concurrently with the test sample(s) as detailed in the referenced SOPs and that all test conditions have been found to meet the required acceptance criteria for a valid test, including the appropriate results for the positive and negative controls.

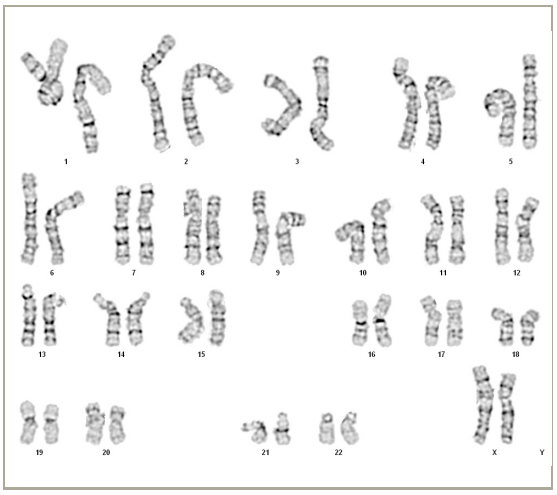
Chromosome Analysis Report: 008268

Report Date: June 05, 2012

Cell Line: WA09-WB0139 10503
Passage #: 28
Date of Sample: 5/29/2012
Date Completed: 6/5/2012

Specimen: hESC on MEF feeder
Cell Line Gender: Female
Reason for Testing: lot release testing
Investigator: [redacted] Core

Results: 46,XX



Cell: S01-23
Slide: 1-R1(10)KARYOTYPE
Slide Type: Karyotyping

# of Cells Counted: 20
# of Cells Karyotyped: 4
# of Cells Analyzed: 8
Band Level: 425-500

Interpretation:
No clonal abnormalities were detected at the stated band level of resolution.

Completed by [redacted] **MS, CG(ASCP), on 6/4/2012**
Reviewed and interpreted by [redacted]**, PhD, FACMG, on 6/5/2012**

A signed copy of this report is available upon request.

Date:_____ **Sent To:**_____
Sent By:_____ **QC Review By:** _____

Limitations: This assay allows for microscopic visualization of numerical and structural chromosome abnormalities. The size of structural abnormality that can be detected is >3-10Mb, dependent upon the G-band resolution obtained from this specimen. For the purposes of this report, band level is defined as the number of G-bands per haploid genome. It is documented here as "band level", i.e., the range of bands determined from the four karyograms in this assay. Detection of heterogeneity of clonal cell populations in this specimen (i.e.,mosaicism) is limited by the number of metaphase cells examined, documented here as "# of cells counted".

This assay was conducted solely for listed investigator/institution. The results may not be relied upon by any other party without the prior written consent of the Director of the WiCell Cytogenetics Laboratory. The results of this assay are for research use only. If the results of this assay are to be used for any other purpose, contact the Director of the WiCell Cytogenetics Laboratory.