Certificate of Analysis

Thaw and Culture Details

Cell Line Name	**STAN256i-649C2**	
WiCell Lot Number	**DB44439**	
Provider/Client	Stanford University – Laboratory of Dr. Thomas Quetermous	
Banked By	Icahn School of Medicine at Mount Sinai Stem Cell Core	
Thaw and Culture Recommendations	WiCell recommends thawing 1 vial into 2 wells of a 6 well plate using mTeSR™Plus and Matrigel®. WiCell recommends thawing using ROCK Inhibitor for best results.	
Protocol	WiCell Feeder Independent Pluripotent Stem Cell Protocol	
Culture Platform Prior to Freeze	Medium: mTeSR™1	Matrix: Matrigel®
Passage Number	p13 Cells were cultured for 13 passages prior to freeze.Plated cells at thaw should be labeled passage 14.	
Date Vialed	30-July-2015	
Vial Label	ISMMS 649i C2P13 SLD 073015	
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.	

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The material provided under this certificate has been subjected to the tests specified and the results and data described herein are accurate based on WiCell's reasonable knowledge and belief. Appropriate Biosafety Level practices and universal precautions should always be used with this material. For clarity, the foregoing is governed solely by WiCell's Terms and Conditions of Service, which can be found at http://www.wicell.org/privacyandterms.

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Results

Test Description	Test Provider	Test Method	Test Specification	Result
Karyotype	WiCell	G-T-L Banding performed on 20 metaphase cells	Expected karyotype	See Report
	Results: 47,XY,+20[2]/46,XY[18] Nonclonal findings: 47,XY,+8 ***Interpretation:*** This is an abnormal karyotype. An extra copy of chromosome 20 (trisomy 20) is present in two of twenty-one cells examined. This chromosomal aberration is recurrently acquired in pluripotent stem cell cultures. No other clonal abnormalities were detected at the stated band level of resolution. There is a nonclonal finding, listed above, which contains a chromosomal aberration (gain of chromosome 8) recurrently acquired in pluripotent stem cell cultures. Nonclonal findings may result from technical artifact, but may be due to a developing clonal abnormality or to low-level mosaicism.		
Post-Thaw Viable Cell Recovery	WiCell	Thaw using specified Thaw & Culture Recommendations	Recoverable attachment after passage	Pass
Identity by STR	WiCell	PowerPlex 16 HS System by Promega™	Defines STR profile of deposited cell line	See Report
Mycoplasma	WiCell	PCR	Amplification of mycoplasma specific DNA detected with negative result	Pass
Sterility	Steris	Native Product Direct Transfer using FTM and TSB (ST/07)	Negative for growth following 14 days of culture	Pass

Testing Reported by Provider

Test Description	Method	Result
Mycoplasma	Lonza MycoAlert kit	Negative

The Provider stated that some or all of the additional analyses listed below may have been performed for this cell line. For more information, publication and dbGaP links, where available, are provided on the cell line specific web page on the WiCell website.

- RNA-Seq
- Whole Genome Sequencing
- Infinium® Expanded Multi-Ethnic Genotyping Array (MEGA^{EX})

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Approval Date	WiCell Quality Assurance Approval
14-July-2022	7/14/2022 X HEB HEB WiCell Quality Assurance Signed by: Bruner, Haley

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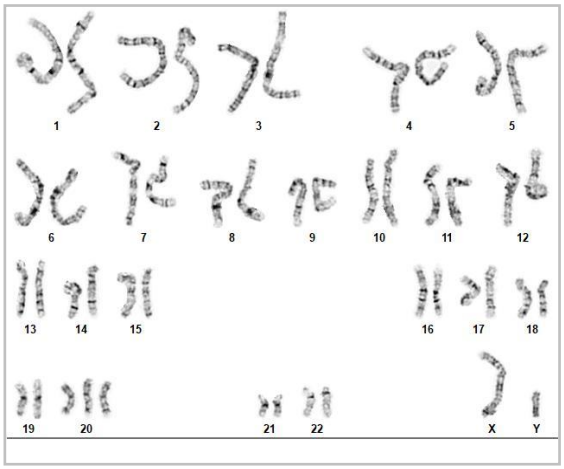
Chromosome Analysis Report: 092556

Date Reported: Friday, June 24, 2022
Cell Line: STAN256i-649C2-DB44439
Submitted Passage #: 15
Date of Sample: 6/16/2022
Specimen: Human IPSC
Results: 47,XY,+20[2]/46,XY[18]

Nonclonal findings: 47,XY,+8

Cell Line Sex: Male
Reason for Testing: LOT_RELEASE
Investigator: WiCell Stem Cell Bank, WiCell



Cell: 9
Slide: G03
Slide Type: Karyotype

Total Counted: 21
Total Analyzed: 9
Total Karyogrammed: 5
Band Resolution: 425 - 525

Interpretation:

This is an abnormal karyotype. An extra copy of chromosome 20 (trisomy 20) is present in two of twenty-one cells examined. This chromosomal aberration is recurrently acquired in pluripotent stem cell cultures. No other clonal abnormalities were detected at the stated band level of resolution.

There is a nonclonal finding, listed above, which contains a chromosomal aberration (gain of chromosome 8) recurrently acquired in pluripotent stem cell cultures. Nonclonal findings may result from technical artifact, but may be due to a developing clonal abnormality or to low-level mosaicism.

Completed by: Leah George, CG(ASCP)
Reviewed and Interpreted by: Kaitlin C. Lenhart, PhD, FACMG

For internal use only

Date:_____ **Sent By:**____ **Sent To:**_____ **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 of this assay are for research use only. Unless otherwise mutually agreed in writing, the services provided to you hereunder by WiCell Research Institute, Inc. ("WiCell") are governed solely by WiCell's Terms and Conditions of Service, found at www.wicell.org/privacyandterms. Any terms you may attach to a purchase order or other document that are inconsistent, add to, or conflict with WiCell's Terms and Conditions of Service are null and void and of no legal force or effect.

Short Tandem Repeat

Requestor: WiCell Stem Cell Bank, WiCell
Samples Received: 16Jun22, 15Jun22, 14Jun22, 13Jun22
STR Amplification Date: 22Jun22

Form SOP-89.01
Version 8.0

Sample Name	STAN220i-504C2-DB35478 p15	STAN256i-649C2-DB44439 p15	WIZ03e-H9CAGhM3Dq-WB67889 p43	STAN223i-509C3-DB44168 p14	STAN222i-509C2-DB44165 p14	STAN255i-649C1-DB44436 p15	PENN003i-661-4-DB36301 p15
Label on tube	92557	92556	92553	92545	92544	92501	92500
FGA	[redacted]						
TPOX							
D8S1179							
vWA							
Amelogenin							
Penta_D							
CSF1PO							
D16S539							
D7S820							
D13S317							
D5S818							
Penta_E							
D18S51							
D21S11							
TH01							
D3S1358							
Allelic Polymorphisms	28	26	24	28	28	26	25
Matches*		92501	See Matches Comment	92544	92545	92556	
Comments		[1]Allelic Imbalance		[2]Allelic Imbalance		[1]Allelic Imbalance	

Identifying information has been redacted to protect donor confidentiality. If more information is required, please contact info@wicell.org

**Note: The STR profile of the following sample is an exact match for the given sample/samples.*

Short Tandem Repeat

Requestor: WiCell Stem Cell Bank, WiCell
Samples Received: 16Jun22, 15Jun22, 14Jun22, 13Jun22
STR Amplification Date: 22Jun22

Sample Name	WIC-WA09-MB-002 p27
Label on tube	92481
FGA	26, 28
TPOX	10, 11
D8S1179	8, 14
vWA	17, 17
Amelogenin	X, X
Penta_D	9, 13
CSF1PO	11, 11
D16S539	12, 13
D7S820	9, 11
D13S317	9, 9
D5S818	11, 12
Penta_E	11, 14
D18S51	13, 13
D21S11	30, 30
TH01	9.3, 9.3
D3S1358	13, 16
Allelic Polymorphisms	24
Matches*	See Matches Comments
Comments	

**Note: The STR profile of the following sample is an exact match for the given sample/samples.*

Short Tandem Repeat

Requestor: WiCell Stem Cell Bank, WiCell
Samples Received: 16Jun22, 15Jun22, 14Jun22, 13Jun22
STR Amplification Date: 22Jun22

Assay Description: STR analysis is performed using the PowerPlex 16 HS System by Promega™. Results are reported as 13 CODIS STR markers, Amelogenin for gender determination and two low-stutter, highly discriminating pentanucleotide STR markers.

Results: The genotypic profiles comprise a range of 24-28 allelic polymorphisms across the 15 STR loci analyzed.

Interpretation: 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 suggests that the cells submitted correspond to the cell lines as named and were not contaminated with any other human cells or a significant amount of mouse feeder layer cells.

Sensitivity: Sensitivity limits for detection of STR polymorphisms unique to either this or other human cell lines is ~2-5%.

Matches: Samples 92553 and 92481 are 100% match to each other and to 84552, 84553, 84656, 84930, 84931, 84932, 86113, 89607, 90917, 90918 and additional profiles. Additional matches can be provided upon request.

[1]**Allelic Imbalance:** Allelic imbalance was observed in sample 92556 and 92501 at the Amelogenin loci. This could be the result of chromosomal gains, losses, and/or amplifications in the cell line.

[2]**Allelic Imbalance:** Allelic imbalance was observed in sample 92545 at the vWA loci. This could be the result of chromosomal gains, losses, and/or amplifications in the cell line.

6/28/2022 X Molly Miles Tech #1 Characterization Signed by: Miles, Molly	6/28/2022 X Anna Lisa Larson Tech #2 Characterization Signed by: Larson, Anna Lisa	6/28/2022 X Dawn Graham QA Review Quality Assurance Signed by: Graham, Dawn

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Raw data is available upon request.

Mycoplasma Assay Report

PCR-based assay performed by WiCell
WiCell Stem Cell Bank, WiCell
21Jun22

Sample Name	Result	Interpretation
STAN220i-504C2-DB35478 p15 (92557)	Negative	Band was not seen at 270bp, indicating the absence of mycoplasma.
STAN256i-649C2-DB44439 p15 (92556)	Negative	Band was not seen at 270bp, indicating the absence of mycoplasma.
Positive (+) Control	Positive	
Negative (-) Control	Negative	

Assay Description
Sample is tested for presence of mycoplasma using EZ-PCR™ Mycoplasma Detection Kit (Sartorius).

6/21/2022 X Justin Hobson Tech #1 Characterization Signed by: Hobson, Justin	6/21/2022 X Molly Miles Tech #2 Characterization Signed by: Miles, Molly	6/22/2022 X Dawn Graham QA Review Quality Assurance Signed by: Graham, Dawn

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A gel image is available upon request.

Native Product Sterility Report

STERIS

WiCell
504 S Rosa Road, Rm 101
Madison, WI 53719

SAMPLE #: 19102854
DATE RECEIVED: 31-Oct-19
TEST INITIATED: 11-Nov-19
TEST COMPLETED: 25-Nov-19

SAMPLE NAME / DESCRIPTION:

STAN100i-108C4 WB67324 15096
WC058i-108-1-2-16 WB67325 15097
STAN255i-649C1 DB44436 15098
STAN256i-649C2 DB44439 15099
PENN005i-35-3 DB36317 15100
PENN006i-149-1 DB36519 15101
PENN007i-765-3 DB36286 15102
PENN008i-77-5 DB36507 15103
PENN012i-93-2 DB34713 15104
PENN013i-72-1 DB35089 15105

UNIQUE IDENTIFIER: NA

TEST RESULTS:

# Tested	# Positives (Growth)	- Control
10	0	2 Negatives

TEST SUMMARY:

# Samples	Media Type	Volume (mL)	Incubation Temperature (° C)	Incubation Duration (Days)
10	TSB	40	20-25	14
10	FTG	40	30-35	14

REFERENCE: Processed according to LAB-003: Sterility Test Procedure
PD #: 000053
TEST METHODOLOGY: USP - Direct Transfer

COMMENTS: NA

REVIEWED BY _____ DATE 26 NOV 19

Specific test results may not be indicative of the characteristics of any other samples from the same lot or similar lots. This test report shall not be reproduced, except in full, without prior written approval. Liability is limited to the costs of the tests.Results applied to samples as received.