



CORIELL INSTITUTE

FOR MEDICAL RESEARCH

GM24666*A

Certificate of Analysis

Product description	Human fibroblast reprogrammed with four factors (OCT4, SOX2, KLF4, CMYC) using retroviral vectors	
Publication(s) describing iPSC establishment	Israel et al. Nature 482, 216-220 (2012)	
Parent cell line and cell type	Not Available	Fibroblast
Diagnosis	Alzheimer's Disease	
Passage of iPSC reported at submission	10	
Number of passages at Coriell	7	
Media	KO DMEM +20% KOSR +10ng/ml bFGF	
Feeder or Matrix Substrate	CF1 MEFs on 0.1% gelatin seeded at 2×10^5	
Passage method	TrypLE Express ¹	
Split ratio	1:3; every 5-7 days; Slow grower	

The following testing specifications have been met for the specified product lot:

Test Description	Test Method	Test Specification	Result
Post-Thaw Viable Cell Recovery	Colony Doubling	Colony formation and diameter doubling within 5 days	Pass
Sterility	Growth on agar	Negative	Pass
Mycoplasma	PCR	Negative	Pass
Karyotype	G-banding	46,XY	Pass
Identity Match	STR (THO-1, D22S417, D10S526, vWA31, D5S592, and FES/FPS)	Match parent fibroblast line	N/A ²
Surface Antigen Expression of Stem Cell Markers	Immunostaining	> 80% expression of SSEA-4	Pass
Pluripotency	Illumina Array and PluriTest Software (www.pluritest.org)	Pluripotency Score greater than 20 and a Novelty Score less than 1.62	Pluripotency: 34.4 Novelty: 1.4

N/A: Not Available

Post-Thaw Viability

One vial of distribution lot was thawed. Cultures were observed daily. Colonies were photographed when they first appeared, then 4 days later (Colonies must double in diameter within 5 days). Area for 5 colonies was measured using the CellSens software on an Olympus IX50 microscope at 40x magnification. The average area is reported here.

Day 7	95,930 μm^2
Day 11	723,289 μm^2



Figure 1A. Colony observed post thaw

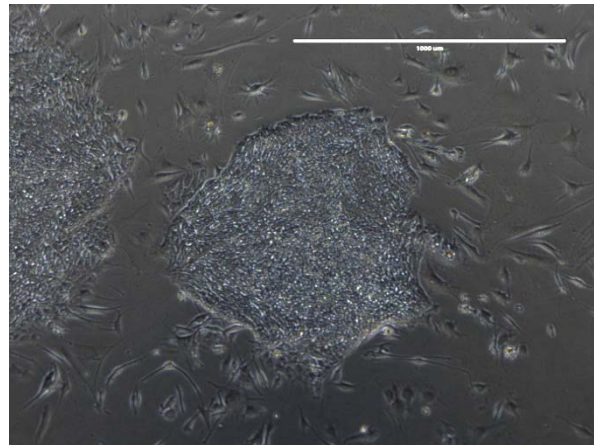


Figure 1B. Colony 4 days after first observation

Karyotype Analysis

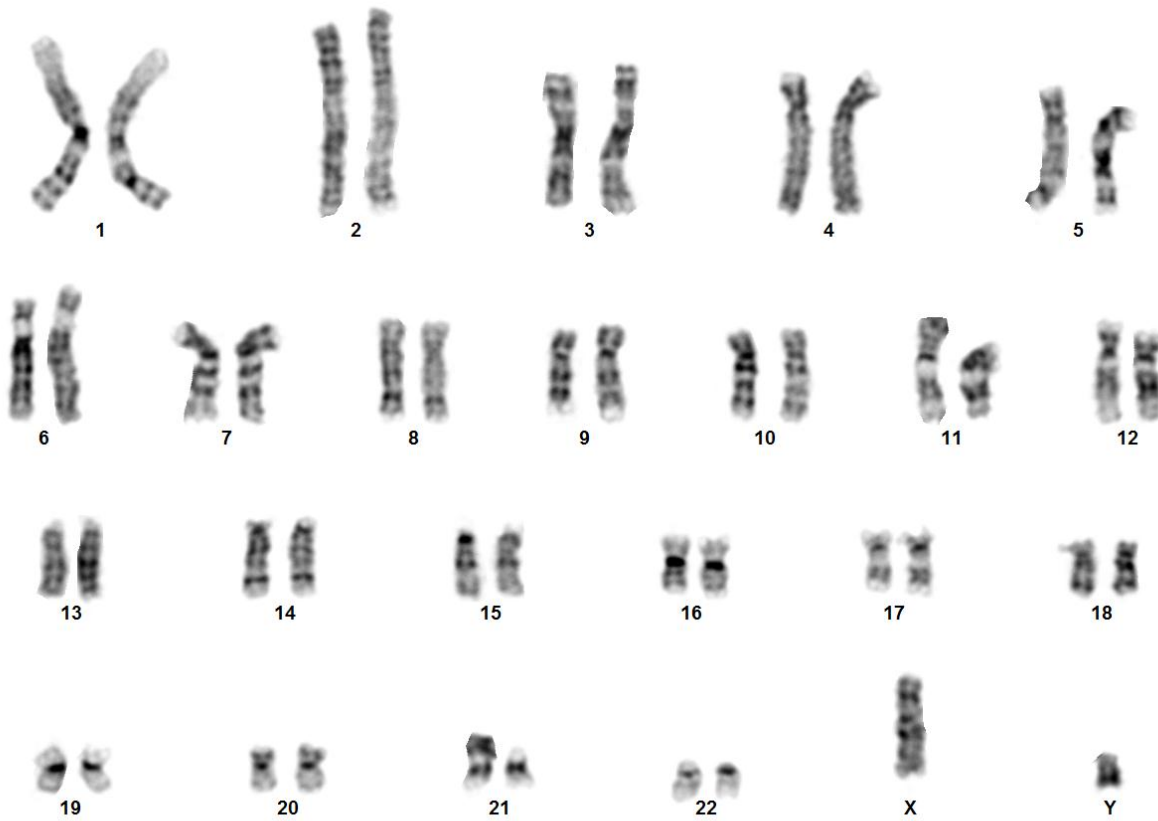


Figure 2: G-banded karyotype showing 46,XY

Surface Antigen Expression of Stem Cell Markers

Undifferentiated cells are stained for the surface antigen, SSEA4. SSEA4 (stage specific embryonic antigen 4) is expressed on undifferentiated human pluripotent stem cells.

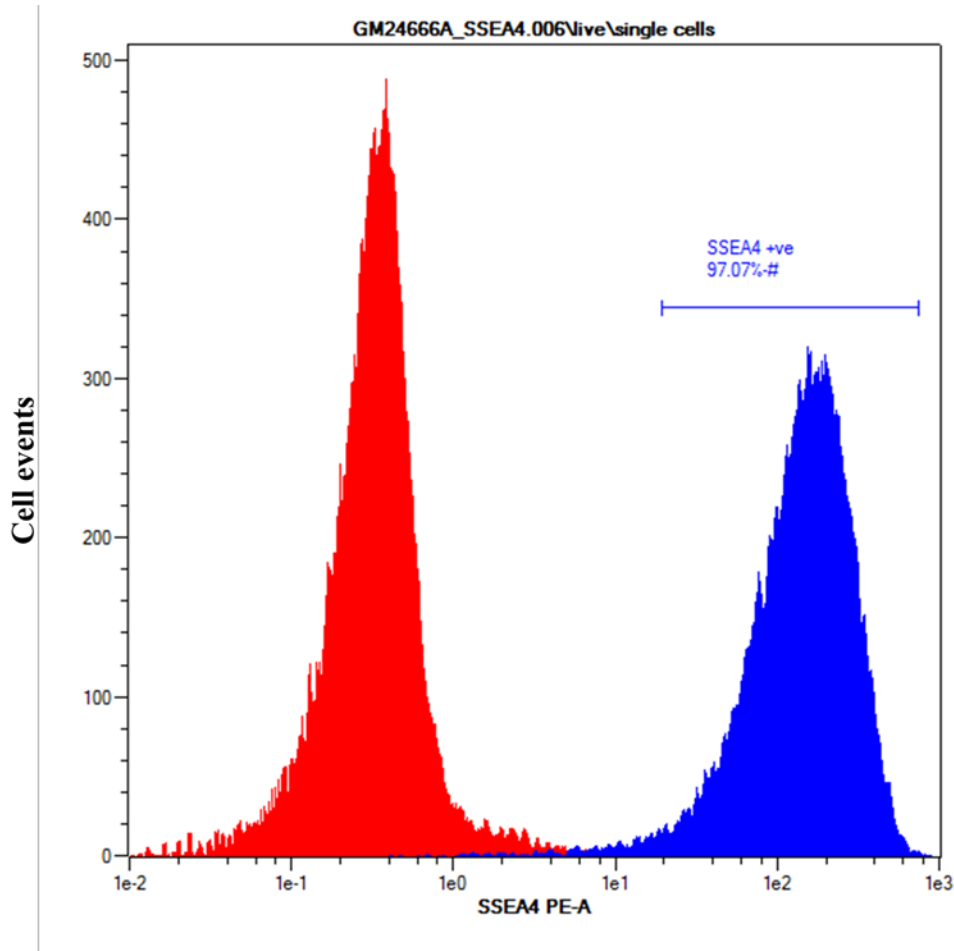


Figure 3: Representative histogram of SSEA-4 positive population. Histogram is an overlay of negative control (red) and SSEA-4 positive population (blue).

Assessment of Pluripotency of a Cell Line

Cells are directed to differentiate to assess the pluripotency of the cell line. RNA is harvested and gene expression is analyzed by real-time PCR. Ct values are adjusted to the endogenous housekeeping gene (GAPDH). Relative gene expression is shown as fold difference in expression to that of the undifferentiated cells. Calculations were done using $2^{-\Delta\Delta CT}$ method.

Embryoid Body (EB) Formation Assay

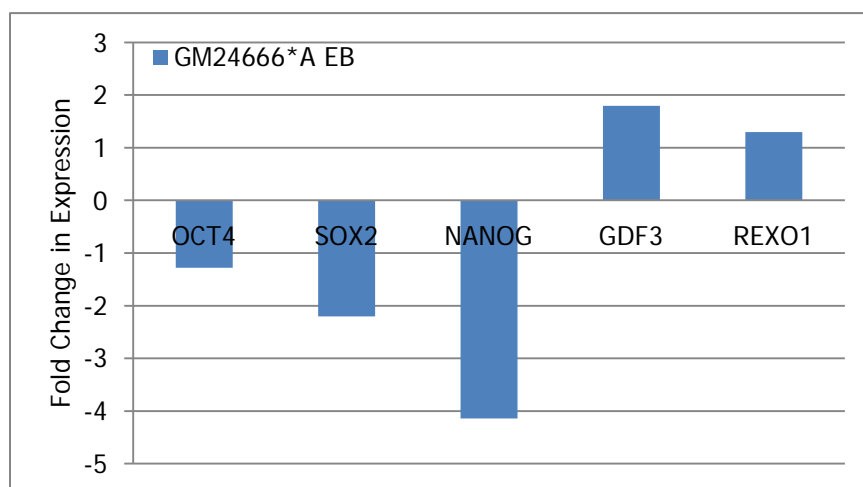


Figure 4A. Pluripotency gene silencing following EB differentiation. Fold difference is shown relative to undifferentiated iPS cell line.

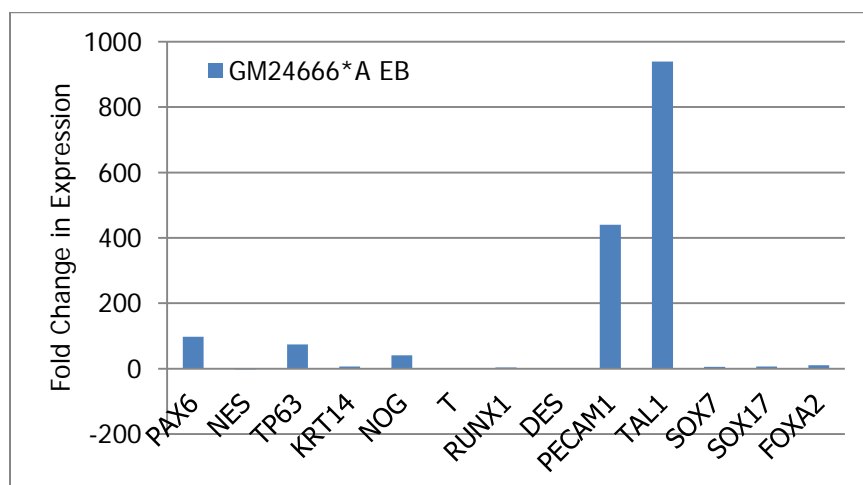


Figure 4B. Lineage specific gene expression following EB differentiation. Fold difference is shown relative to undifferentiated iPS cell line.

Pluripotency Markers

	OCT4	SOX2	NANOG	GDF3	REXO1
GM24666*A	-1	-2	-4	2	1

Ectoderm

	PAX6	NES	TP63	KRT14	NOG
GM24666*A	98	-3	74	7	41

Mesoderm

	T	RUNX1	DES	PECAM1	TAL1
GM24666*A	1	3	1	440	939

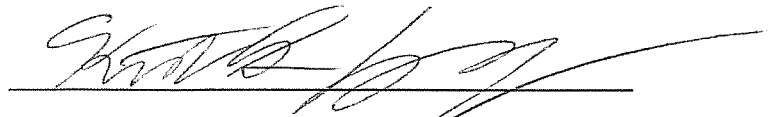
Endoderm

	SOX17	FOXA2	SOX7	AFP
GM24666*A	6	10	6	958149

Table 1. Fold difference values of gene expression of EB. Fold difference is relative to undifferentiated cells. Ct values are normalized to that of GAPDH.


Notes:

1. During passage, if stringy clumps occur, use a P1000 pipette tip after scraping.
2. Parental fibroblast was not received to perform parental identity comparison.



Stem Cell Biobank Technician
Date 12/9/14

- Pass
 Fail
 Other: _____



Shilpa Gandre-Babbe, PhD
Group Leader, Stem Cell Biobank
Date 12-11-14