

| | | | |
|--|---|---------------------------|----------------|
| Title of Qualification: | Qualification of Pharmacidal Disinfection Solution in a Cell Culture Incubator Chamber | | |
| Test Material Name and Lot # | Pharmacidal Disinfection Solution lot 250400 | | |
| Cell Culture Medium Used | Medium Name: mTeSRI | | |
| | Component | Manufacturer | Lot # |
| | Basal Medium | STEMCELL Technologies | 15J66194 |
| | 5X Supplement | STEMCELL Technologies | 15J66193 |
| | 250X Growth Factor without bFGF | STEMCELL Technologies | 15J66192 |
| | bFGF | Waisman | WC-FGF2-FP-004 |
| Platform/Matrix (MEFs, matrigel, etc) | Matrigel | | |
| Technician | | | |
| Start and End Dates of Qualification | 03Aug16 to 31Aug16 | | |
| PSC line, lot, and thaw used | WIC-WA09-RB-001-T34976 | | |
| Pre- Karyotype (enter "Normal" or "Abnormal" and the sample #) | Normal | Karyotype Sample #: 11754 | |
| Post-Karyotype (enter "Normal" or "Abnormal" and the sample #) | Normal | Karyotype Sample #: 11802 | |
| QC Qualification Sample ID | 11762 | | |

Experimental design:

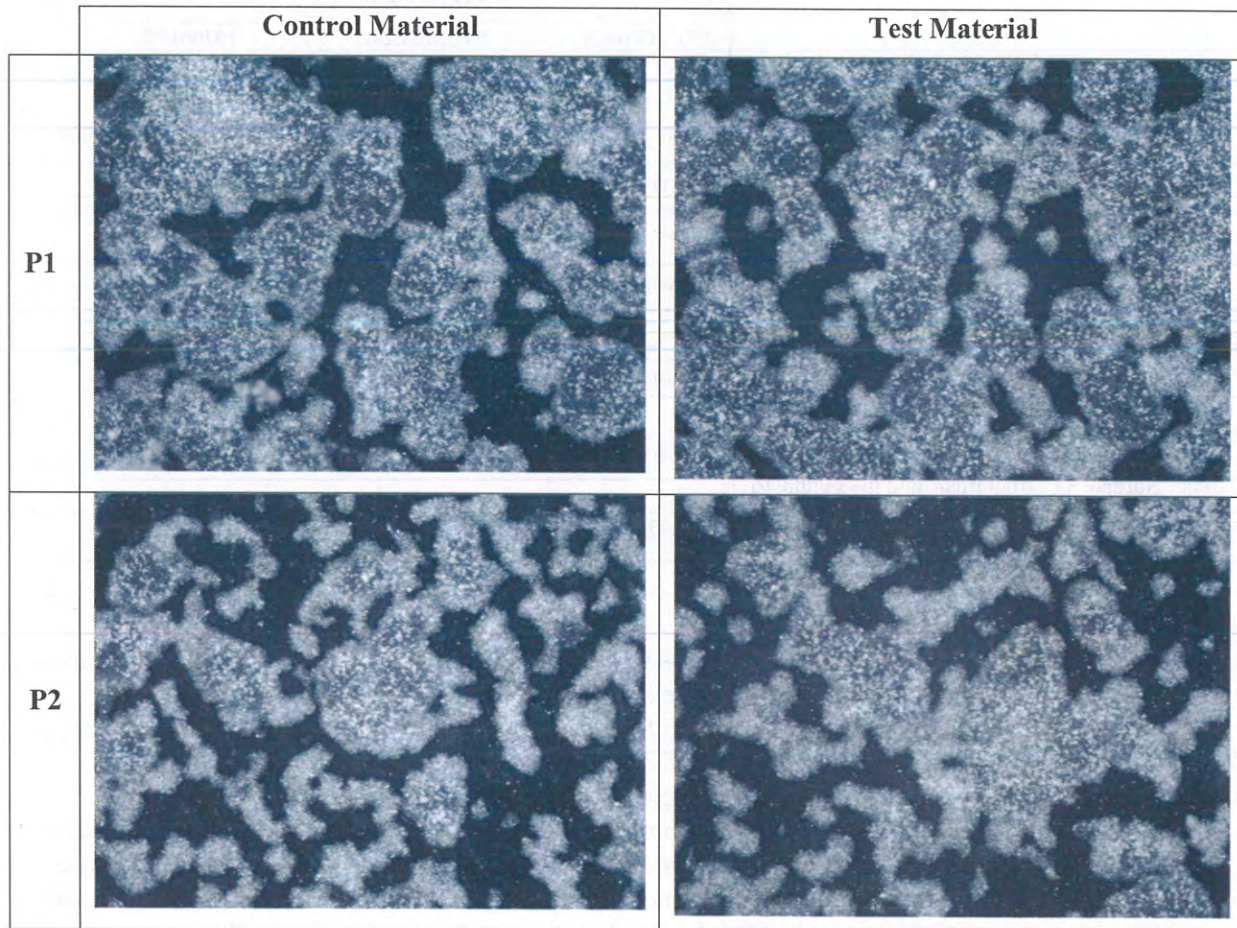
Pharmacidal Disinfection Solution lot 250400 was tested for the potential to affect the undifferentiated state and the expansion rate of pluripotent stem cells (PSCs) when used in a properly maintained incubator chamber (parameters set at 37°C, 5% CO₂). The Test Chamber was treated with Pharmacidal Disinfection Solution at the initiation of the study, and again at every passage of the test culture. Treatment consisted of spraying Pharmacidal three times on each shelf to ensure surface coverage as well as the bottom of the incubator chamber and humidity pan. The test culture plate was not removed during this treatment and was also sprayed as a result of this process. Recently karyotyped cells originating from a single culture were passaged into two separate cultures; one culture was maintained in the incubator chamber with Pharmacidal Disinfection Solution treatment, the other culture was maintained in a chamber without Pharmacidal Disinfection Solution – all other culture parameters including medium, matrix, gas atmosphere, temperature, technician, processing times, etc., remained the same between the cultures. Cultures were maintained for 5 passages in each respective chamber. Following 5 passages, the resulting cultures were submitted for karyotype, assayed via flow cytometry to determine the percent of undifferentiated cells in culture, assessed for overall expansion rate, and morphology was examined. Testing was performed per WiCell’s SOP-QU-005-F, Quality Control Testing of Cell Culture Reagents. Documentation was recorded in notebook 187 pages 95-123.

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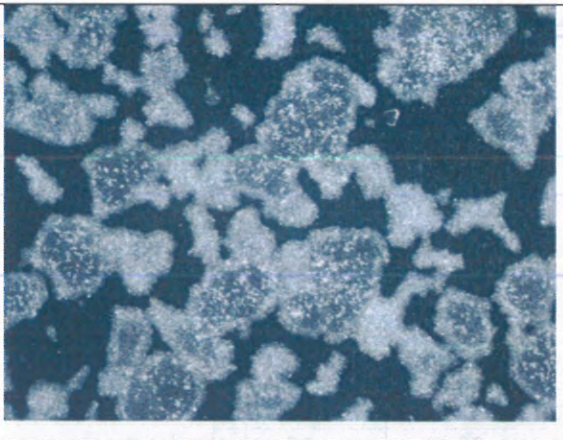
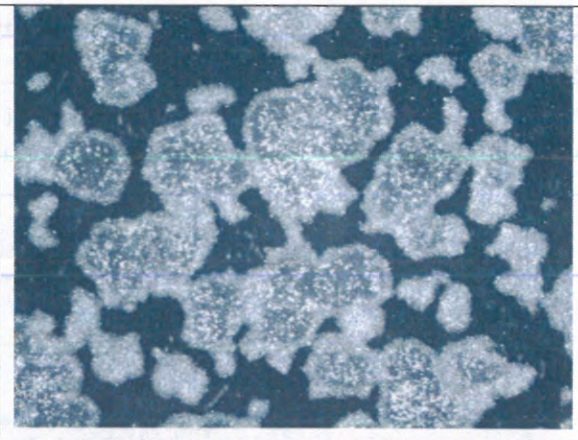

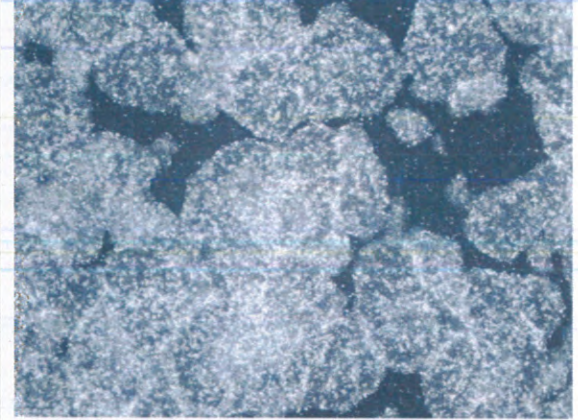
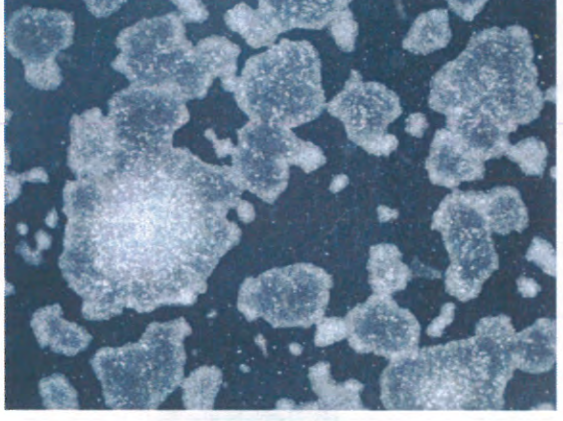
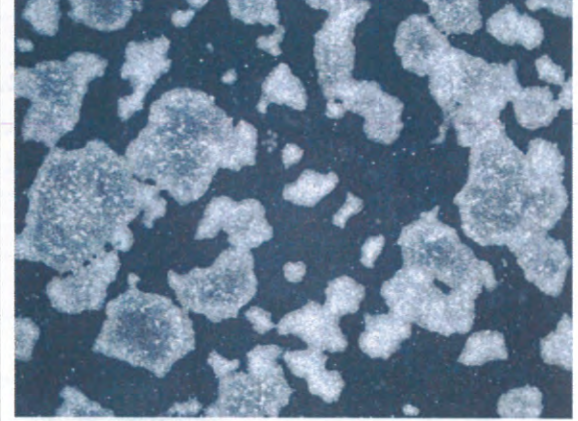
Equipment:

| | | |
|-------------------|---------------------------|-------------|
| BioSafety Cabinet | 3-digit equipment ID: 094 | Room #: 119 |
| Incubator | 3-digit equipment ID: 125 | Room #: 115 |
| Microscope | 3-digit equipment ID: 194 | Room #: 119 |
| Micropipettor | S/N: Y60607A | Room #: 119 |

Images of PSCs just prior to passaging at 2x magnification:



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| | | |
|----|---|--|
| P3 |  |  |
| P4 |  |  |
| P5 |  |  |
| | Control Material | Test Material |

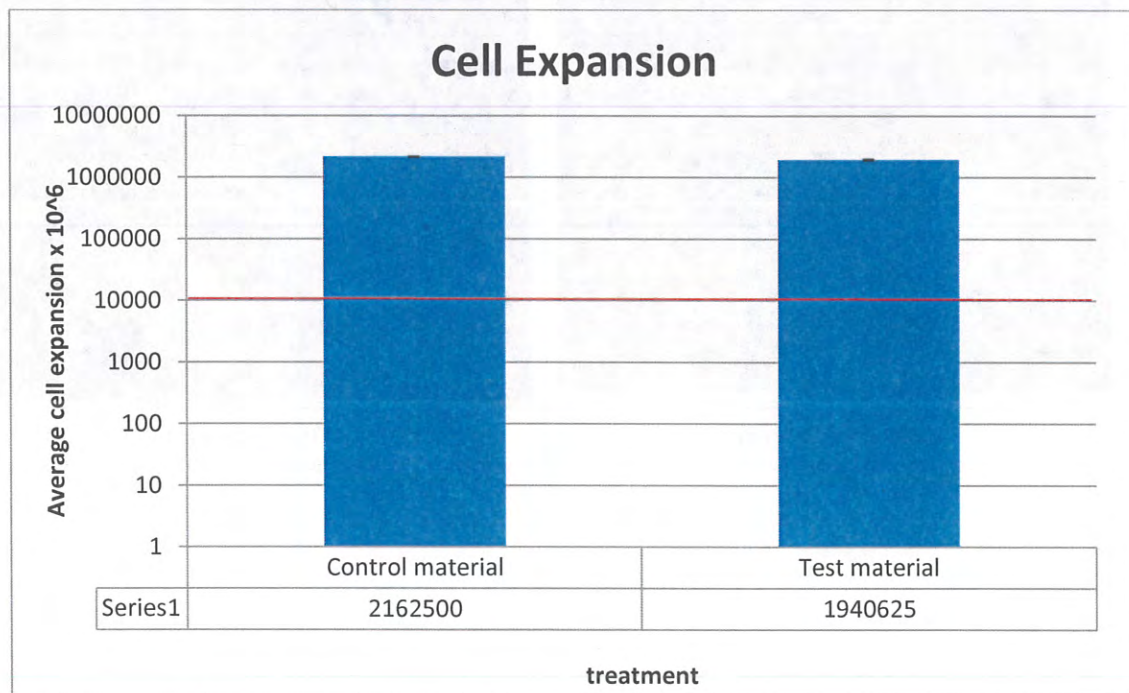
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Proliferation Data (Split Ratios and Cell Counts):

Minimum Acceptable Expansion Rates:

Cultures passaged with EDTA: Average rate of 1:10 and at least 1 million cells/well at final count.
Virtual expansion per well to equal 10000 wells at 1 million cells/well = 10000 million cells.

| Virtual Expansion Information Table | | |
|--|----------------------------------|-------------------------------|
| Passage # | Control Material Split Ratio 1:X | Test Material Split Ratio 1:X |
| 1 to 2 | 20 | 20 |
| 2 to 3 | 25 | 25 |
| 3 to 4 | 25 | 25 |
| 4 to 5 | 25 | 25 |
| Total Virtual Wells | 312500 | 312500 |
| Average Viable Cells / Well x10 ⁶ | 3.46 | 3.10 |
| Virtual Expansion x 10 ⁶ cells | 2162500 | 1940625 |

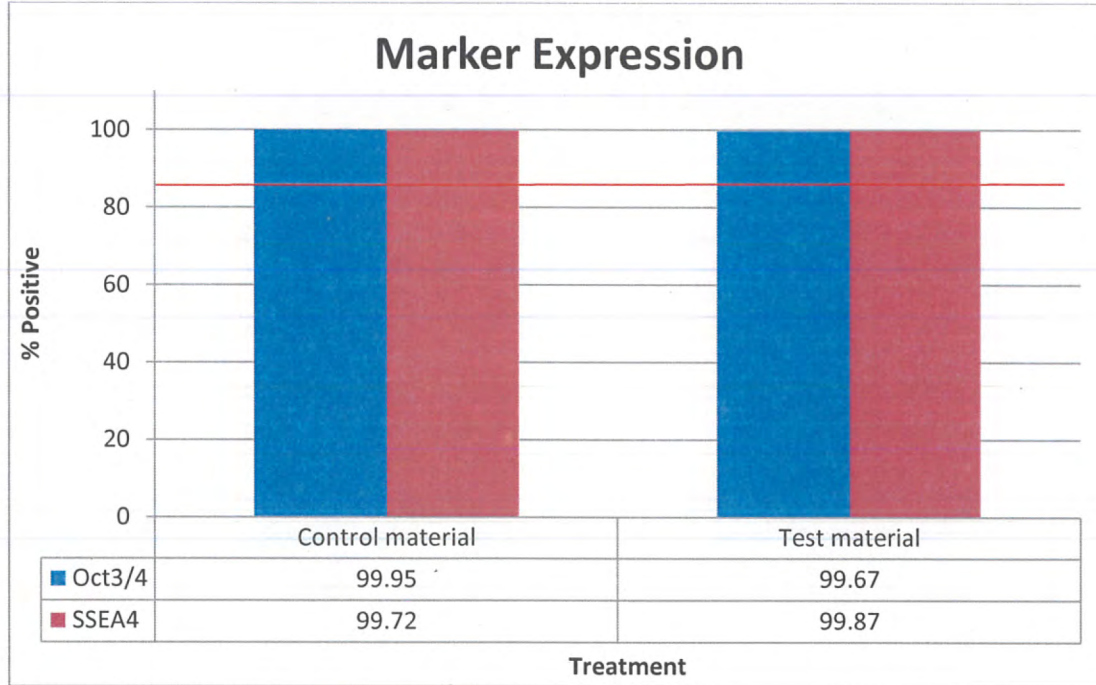


Red line indicates minimum acceptable expansion.

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Marker Expression:

Minimal expression acceptable: $\geq 85\%$ positive for Oct3/4 and SSEA4 markers for undifferentiated PSCs.



Red line indicates minimum acceptable marker expression.

Conclusions:

No effect on cell proliferation, differentiation, morphology or karyotype was noted for human pluripotent stem cells cultured in the presence of Pharmacial Disinfection Solution (lot 250400) in the chamber of a properly maintained incubator (parameters set at 37°C, 5% CO₂). Cells cultured in the presence of Pharmacial Disinfection Solution met all WiCell requirements for quality. Pharmacial Disinfection Solution equivalent to lot 250400, when used as directed, is appropriate for use in pluripotent cell culture.

Technician Signature: _____ **Date:** _____

Reviewer Signature: _____ **Date:** _____

QA Signature: _____ **Date:** _____

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Date Reported: Tuesday, August 30, 2016

Cell Line: WIC-WA09-RB-001 11802

Passage#: 51(5)

Date of Sample: 8/26/2016

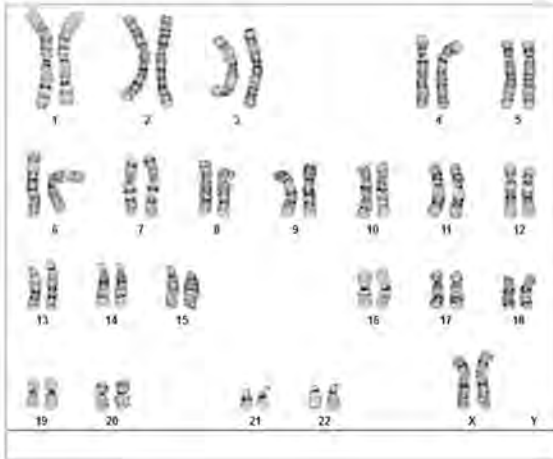
Specimen: hESC

Results: 46,XX

Cell Line Gender: Female

Reason for Testing: Pharmacidal #250400 11762

Investigator:



Cell: 30

Slide: 1

Slide Type: Karyotype

Total Counted: 20

Total Analyzed: 8

Total Karyogrammed: 4

Band Resolution: 450 - 525

Interpretation:

This is a normal karyotype. No clonal abnormalities were detected at the stated band level of resolution.

Completed by:

Reviewed and Interpreted by:

A signed copy of this report is available upon request.

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 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.

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