

CONTRACT ASSAY SERVICES

**CONTRACT ASSAY SERVICES
FOR STEM AND PROGENITOR CELLS**



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HELPING MAKE YOUR RESEARCH WORK

15 YEARS OF EXPERIENCE IN STEM CELL BIOLOGY

INTRODUCTION

STEMCELL Technologies Inc.'s Contract Assay Services works with you to develop and perform flexible custom-designed experiments that meet your unique needs and goals. By harnessing our industry-standard reagents and extensive stem cell biology expertise, you will enhance your ability to determine the potency and safety of compounds earlier in the drug development process, thereby saving valuable time and resources. Our experts have conducted more than 400 studies, and have helped over 80 organizations worldwide with their specific research needs.

A high failure rate of late stage drug candidates is cost prohibitive. Traditional drug discovery platforms based on *in vitro* animal, tumor, or genetically-transformed cell lines are often poorly representative of the human condition. Using human primary progenitor cells, we can help you obtain more clinically-relevant data, which may significantly improve your drug candidate's translation into the clinic.



Our customized assays using primary cells can help you:

- Obtain clinically relevant, cost-effective information throughout the drug discovery process
- Reduce animal testing
- Determine safety and efficacy of compounds
- Assess a compound's effects on proliferation and differentiation of various stem and progenitor cells, including:
 - Hematopoietic stem and progenitor cells
 - Mesenchymal stem and progenitor cells
 - Neural stem and progenitor cells

HEMATOPOIETIC STEM AND PROGENITOR CELL ASSAYS

WITH THESE ASSAYS, WE CAN HELP YOU:

- Screen for toxic effects of compounds in blood or bone marrow
- Determine the hematopoietic modulating activity of small molecule compounds
- Assess hematological parameters and progenitor content in clinical samples

OUR VALIDATED^{2,6,7} *IN VITRO* ASSAYS CAN HELP YOU DETERMINE A COMPOUND'S INHIBITORY OR STIMULATORY EFFECTS ON HEMATOPOIETIC PROGENITORS.

- Colony-forming cell (CFC) assays have been shown to be important in the evaluation of potential inhibitory or stimulatory effects of a variety of compounds on hematopoietic¹⁻¹⁰ and mesenchymal^{3,9} progenitor cells
- CFC assays can be used to simultaneously assess proliferation and differentiation of progenitors to determine both IC_{50} and IC_{90} values
- Clinical samples such as cord blood units can be used to evaluate functionality of hematopoietic progenitors and to assist with the determination of sample suitability for transplantation

FIGURE 1. Determination of IC_{50} values for 5-Fluorouracil (5-FU)

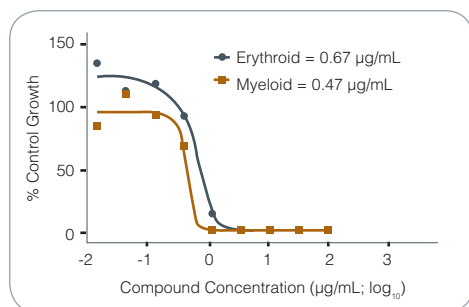
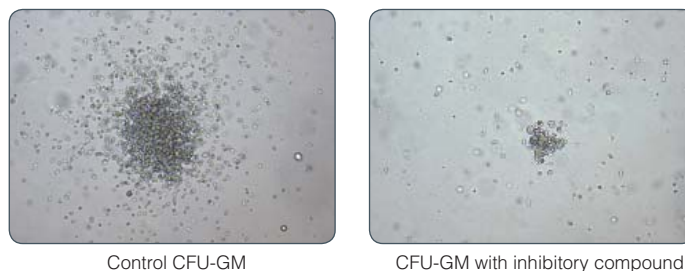


FIGURE 2. Human bone marrow colonies in the presence of an inhibitory compound



OUR *IN VIVO* ASSAYS CAN HELP YOU EXAMINE THE EFFECTS OF A COMPOUND ON HEMATOPOIETIC STEM CELL MOBILIZATION AND RECOVERY.

- Assess hematopoietic stem cell mobilization into the peripheral blood
- Determine kinetics of hematopoietic progenitor recovery following induction of myelosuppression

DID YOU KNOW

CFC assays for myeloid progenitors have been validated for the determination of maximum tolerated doses by the European Centre for the Validation of Alternative Methods (ECVAM). Assays for CFU-GM and CFU-Mk have been shown to be predictive of clinical outcomes such as neutropenia^{2,6} and thrombocytopenia.⁷

MESENCHYMAL STEM AND PROGENITOR CELL ASSAYS

OUR FUNCTIONAL ASSAYS CAN HELP YOU ASSESS THE EFFECTS OF COMPOUNDS ON MESENCHYMAL STEM AND PROGENITOR CELLS DERIVED FROM HUMAN BONE MARROW OR MOUSE COMPACT BONE.

- Determine progenitor frequency and proliferative potential
- Examine overall expansion potential
- Identify differentiation potential of mesenchymal stem cells into adipose, osteogenic and chondrocyte lineages
- Colony-Forming Unit - Fibroblast (CFU-F) assays are important for the evaluation of inhibitory or stimulatory effects of a variety of compounds on mesenchymal stem and progenitor cells

FIGURE 3. Effects of Doxorubicin on Human CFU-F

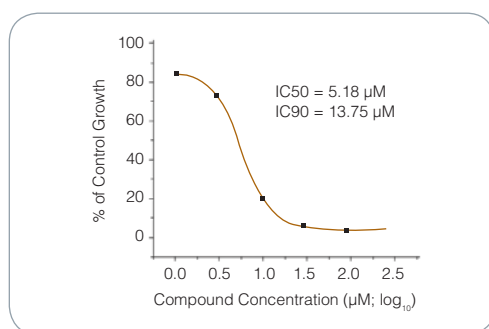


FIGURE 4. Human bone marrow-derived CFU-F colonies in the presence of an inhibitory compound



Control human CFU-F



Human CFU-F with inhibitory compound

DID YOU KNOW

Our facility and procedures are certified to ISO13485:2003. Contracts are performed with controls intended to assure the quality and integrity of the process and data. Such controls may include, but are not limited to, qualified personnel, suitable facilities and equipment, sample and reagent handling and storage, and use of standard operating procedures. Please contact STEMCELL Technologies' Contract Assay Services for more information regarding studies performed under independent QA audit.

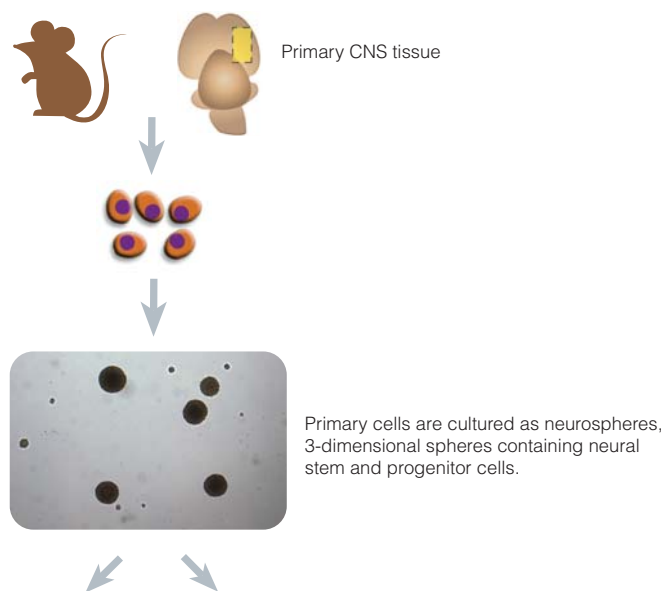
NEURAL STEM AND PROGENITOR

CELL ASSAYS

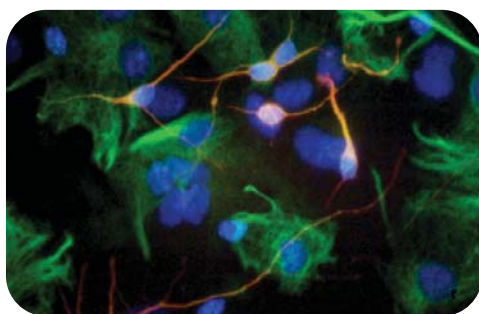
WE CAN HELP EXAMINE THE EFFECTS OF COMPOUNDS AND ENVIRONMENTAL TOXINS ON PRIMARY NEURAL STEM AND PROGENITOR CELLS.

- Determine proliferation potential using the Neural Colony-Forming Cell (NCFC) assay, which enables identification and quantification of both neural stem and progenitor cells
- Assess differentiation potential of neural stem and progenitor cells into neurons, astrocytes and oligodendrocytes

FIGURE 5. Assays for neural stem and progenitor cells

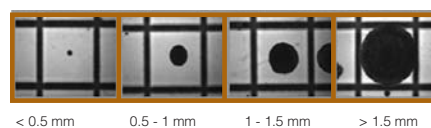


Differentiation assays are used to assess the effects of your compound on the potential of neural stem and progenitor cells to differentiate into astrocytes, neurons and oligodendrocytes.

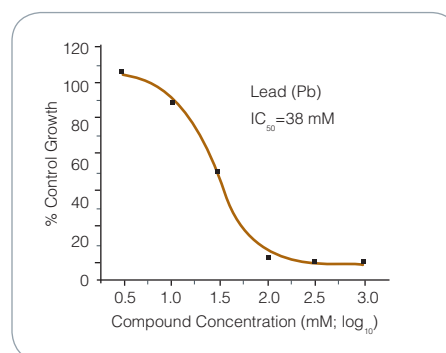


Mouse neurospheres were dissociated and induced to differentiate. Neurons (red) and astrocytes (green) can be detected using immunofluorescent methods.

Proliferation potential can be quantified using the NCFC Assay.



Larger NCFC colonies (>1.5 mm in size) are formed by neural stem cells; the smaller NCFC colonies are formed by more mature neural progenitors.



Dose response curve and IC₅₀ for lead in the NCFC Assay

WE ARE COMMITTED TO PROVIDING YOU WITH THE HIGHEST LEVEL OF SERVICE

- Confidential consultation with our expert scientific staff.
- Custom-designed studies to meet your specific requirements.
- Studies performed using STEMCELL Technologies' industry standard reagents manufactured under ISO13485:2003 guidelines. Studies may be performed under independent QA audit.
- Thorough and timely reporting of data delivered in a comprehensive report that includes summaries, concise details of experimental design, tabulated data and figures, as well as statistical analysis of the data and photographic records.

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