

drug discovery

SigmaScreen™ Coated Multiwell Plates for Cell-Based Assays

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Application Notes

- Increased cell attachment & proliferation in serum-free conditions
- Compatible with many common cell types
- Flexible assay detection
- Enhanced storage convenience

Introduction

Cell-based assays provide a framework to determine the changes an external factor may exert on overall cellular function and viability. The presence of serum in culture media may mask the effects of various stimuli or treatments, therefore, cellular exposure to compounds of interest often occurs in low-serum or serum-free media. It has been demonstrated that many cell lines, including transfected cell lines, exhibit a reduction in adherence to culture surfaces in the absence of serum. As a result, cells may not adhere properly to the culture surface thereby dramatically reducing cell growth and proliferation. Optimization of culture conditions is essential for maximal cell growth and proliferation. By maintaining an environment conducive to promoting and maintaining proper cellular function, the effects of treatments are more accurately determined. SigmaScreen™ Coated Multiwell Plates for cell-based assays provide a culture surface, which has been shown to enhance cell attachment and proliferation in low-serum or serum-free media. By combining our Research & Development expertise in cell culture and surface coating technologies with high quality extracellular matrix (ECM) proteins, we are able to offer one of the broadest product lines of ECM-coated multiwell plates for cell-based assays.

The ECM is located outside the cell membrane. It is primarily comprised of fibrous proteins whose main functions are structure, cell division, and adhesion. Coating a culture

surface such as a polystyrene plate with an ECM protein results in a positively charged surface that has been shown to enhance binding. Although the interaction between cultured cells and ECM proteins has not been completely elucidated, intracellular signaling systems have been shown to mediate the event. In conjunction with these systems, surface receptors on the cell's membrane allow preferential binding to certain ECM proteins resulting in enhanced cell attachment and proliferation. Each cell line is unique in its receptor expression, therefore, the need to validate more than one ECM coating may be necessary to find the ideal assay conditions. SigmaScreen Coated Multiwell Plates are available with several coatings and formats to aid in the evaluation process. High quality ECMs including Poly-D-Lysine, Collagen I from rat tail, and Fibronectin from human plasma are individually coated on either 96- or 384-multiwell polystyrene plates. These plates display compatibility with many established and primary cell lines and as illustrated in Figure 1, the SigmaScreen Poly-D-Lysine coated plates improve attachment of BHK-21 cells by 60% in serum-free media over standard tissue culture treated (TCT) plates or other market competitors. As demonstrated in Figure 2, SigmaScreen Collagen I coated plates offer superior support for increased viability and improved cell morphology of HT-1080.

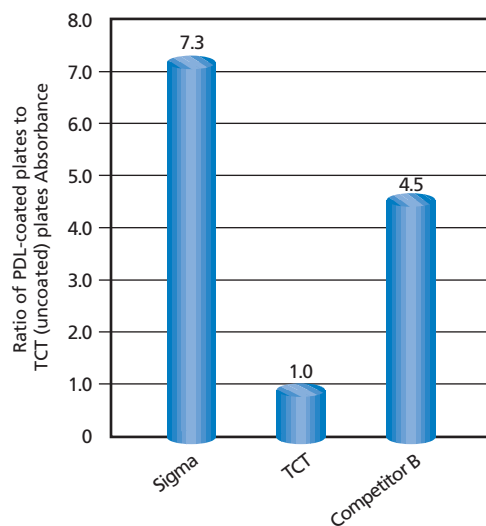


Figure 1. BHK-21 cells (1×10^4 cells/well) were incubated in clear 384-well plates (Product Code [S 7436](#)) for 1 hour (37 °C, 5% CO₂) in serum-free DMEM F-12 medium (Product Code [D 6421](#)). Results show SigmaScreen Poly-D-Lysine (PDL) coated plates display greater than 60% more cell attachment in comparison to standard TCT plates.

Cellular response to treatments or stimuli can be measured by several indicators including changes in proliferation rate or expression of a particular molecule. Accurate detection or evaluation of the effects is crucial to the cell-screening process. Detection by colorimetric, chemiluminescent or fluorescent-based technologies allows

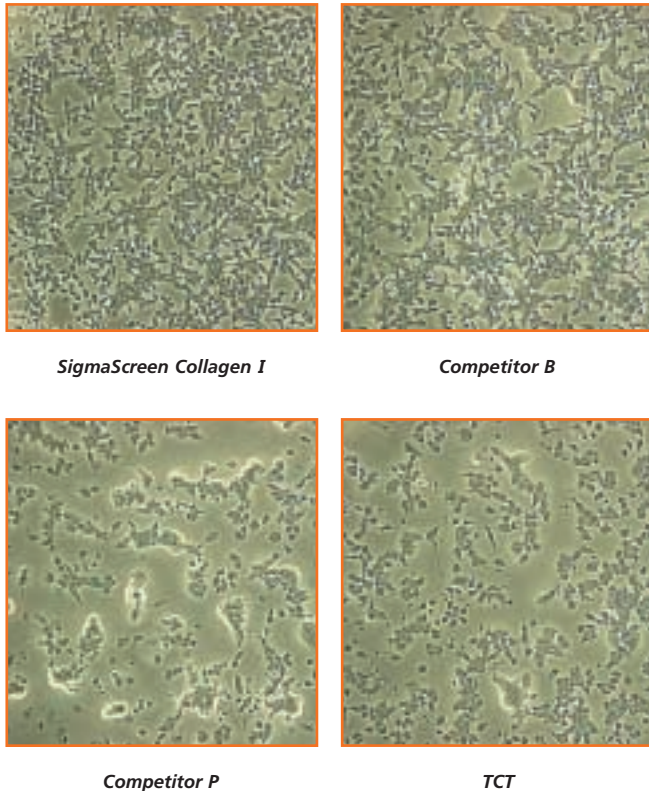


Figure 2. HT1080 cells were seeded in clear 96-well Collagen I coated plates (Product Code [S 8813](#)) at a density of 3×10^5 cells/ml in 100 μ l/well. Cells were incubated for 24 hours in serum-free DME medium (Product Code [D 5671](#)) and washed two times with PBS (Product Code [P 3813](#)). Photographs were taken at 100x. Results show SigmaScreen coated plates demonstrate increased viability and improved cell morphology over competitors and TCT plates.

researchers to choose the most sensitive detection method for their assay. Constant advancements in detection chemistries make it an absolute necessity to eliminate the potential of “cross-talk” between wells. Available in a variety of colors and formats, SigmaScreen ECM-coated Multiwell Plates meet the demands of various assay detection systems and also provide superior binding capacity and well-to-well coating uniformity.

SigmaScreen Coated Multiwell Plates are manufactured under ISO 9002 in our GMP facility and assayed for endotoxins, bacteria, and fungal contamination. In addition to the superior product quality and performance, the ECM-coated multiwell plates also provide flexibility in terms of storage and shelf life. Our proprietary manufacturing and coating process yields a coated plate that provides the added convenience of stability at 2-8 °C or at room temperature as shown in Figure 3.

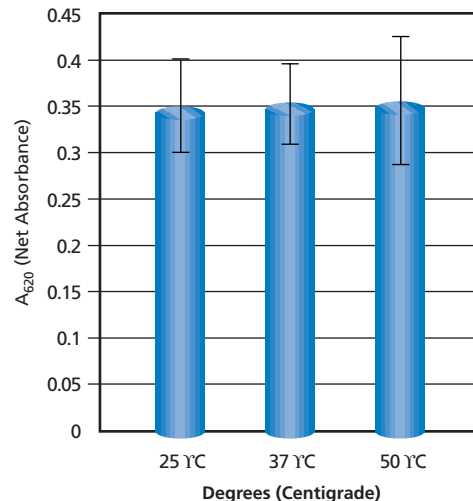


Figure 3. Clear 96-well Collagen coated plates were incubated for two months at 25 °C, 37 °C and 50 °C. HT1080 cells were seeded in the wells (2.0×10^7 cells/ml, 100 μ l/well), and incubated for 24 hours in serum-free DME medium (Product Code [D 5671](#)). The plates were washed three times with PBS (Product Code [P 3813](#)) and lysed with CellLytic™ M Mammalian Cell Lysis/Extraction Reagent (Product Code [C 2978](#)). The total cellular protein attached to the plates was quantitated using Bradford Reagent (Product Code [B 6916](#)), and plates were read in a Wallac Victor plate reader at 620 nm.

Ordering Information

Product	Description	Unit
S 3690	SigmaScreen Collagen Coated Plates, 384-well, black	5 each 50 each
S 3190	SigmaScreen Collagen Coated Plates, 96-well, black	5 each 50 each
S 3440	SigmaScreen Collagen Coated Plates, 384-well, clear	5 each 50 each
S 8813	SigmaScreen Collagen Coated Plates, 96-well, clear	5 each 50 each
S 3565	SigmaScreen Collagen Coated Plates, 384-well, white	5 each 50 each
S 3315	SigmaScreen Collagen Coated Plates, 96-well, white	5 each 50 each
S 7686	SigmaScreen Poly-D-Lysine Coated Plates, 384-well, black	5 each 100 each
M 5307	SigmaScreen Poly-D-Lysine Coated Plates, 96-well, black	5 each 100 each
S 7436	SigmaScreen Poly-D-Lysine Coated Plates, 384-well, clear	5 each 100 each
M 3555	SigmaScreen Poly-D-Lysine Coated Plates, 96-well, clear	5 each 100 each
S 7561	SigmaScreen Poly-D-Lysine Coated Plates, 384-well, white	5 each 100 each
M 5682	SigmaScreen Poly-D-Lysine Coated Plates, 96-well, white	5 each 100 each
S 3815	SigmaScreen Fibronectin Coated Plates, 96-well, clear	5 each 50 each