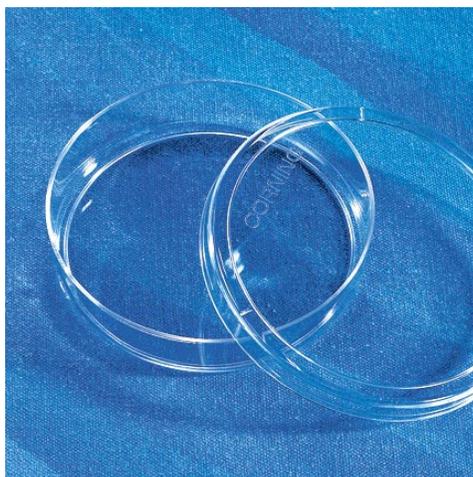
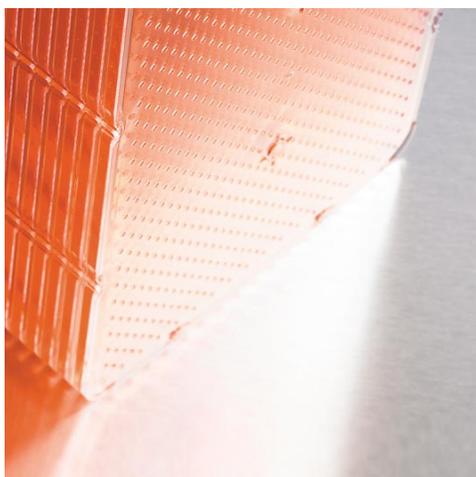
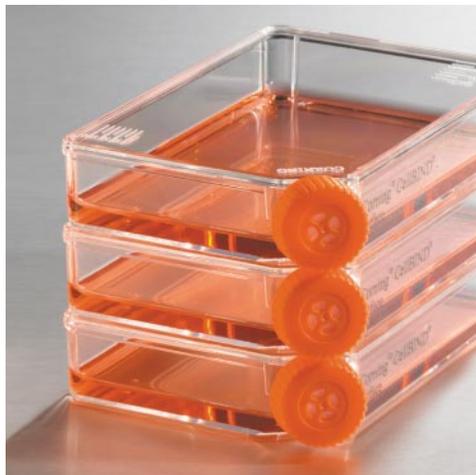


Corning® CellBIND® Surface

A novel surface for improved cell attachment



Increase Cell Growth and Yields with Corning® CellBIND® Surface

Corning CellBIND Culture Surface is the first novel cell culture surface treatment in over 20 years. The Corning CellBIND surface enhances cell attachment under difficult conditions, such as reduced-serum or serum-free medium, resulting in higher cell yields.

Developed by Corning scientists, this patented technology (U.S. Patent No. 6,617,152) uses a microwave plasma process for treating the culture surface. This process improves cell attachment by incorporating significantly more oxygen into the cell culture surface, rendering it more hydrophilic (wetter) and increasing surface stability.

Benefits

- ▶ Better cell attachment leads to increased cell growth and yields
- ▶ More consistent and even cell attachment
- ▶ More quickly adapts cells to reduced-serum or serum-free conditions
- ▶ Reduces premature cell detachment from confluent cultures especially in roller bottles
- ▶ May eliminate the need for tedious, time-consuming, expensive and low stability biological coatings
- ▶ Requires no refrigeration or special handling and is stable at room temperature

Same High Quality Standards as Other Corning Vessels

- ▶ Manufactured from optically clear polystyrene
- ▶ Rigorous QC testing for consistency and reproducibility
- ▶ Certified nonpyrogenic and sterile
- ▶ Printed lot numbers for quality assurance and tracking
- ▶ Printed with the Corning CellBIND Surface logo to differentiate from standard treatment cell culture products and to avoid mix-ups

Cell Dissociation Recommendations

Culture inoculating and harvesting should be performed in the same manner as methods currently being employed. Both enzymatic and nonenzymatic dissociating solutions have been successfully used to remove cells from Corning CellBIND surfaces. These include: Trypsin-EDTA, Accutase®, Versene®, Dispase®, and Citric Saline. Some dissociating agents, such as Dispase or Versene, should be removed by centrifugation prior to plating the cells.



4390 75 cm² Corning CellBIND Surface Flask with Vent Cap

Cell Lines Having Success with Corning CellBIND Surface

| | | |
|-----------|----------------------------------|------------------------|
| CHSE-214 | LNCaP | C8B4 |
| PC-12 | 3T3 | Vero |
| HEK-293 | Caco-2 | BHK |
| CHO | Hep-G2 | PER C6 |
| HTB-13 | U-2 OS | NSC-34 |
| Calu-3 | 16HBE | Transfected cell lines |
| Saos-2 | DLD1 | Endothelial cells |
| MBDK | Primary prostate | Cardiomyocytes |
| E4 embryo | Melanoma | |
| 2/4/A1 | Preadiposites | |
| A549 | Primary rat liver | |
| HUVEC | Primary mouse embryo fibroblasts | |
| | Hi-5 (BTI-Tn-5B1-4) | |
| | HCT-116 | |

Current Corning® CellBIND® Surface Application/Technical Information

The following application/ technical documents are available in their entirety from our website www.corning.com/Lifesciences. These documents individually and collectively support the benefits of using the Corning CellBIND Surface. These documents include:

- ▶ Corning CellBIND Surface: An Improved Surface for Enhanced Cell Attachment
- ▶ Enhanced Attachment of LNCaP Cells to the Corning CellBIND Surface
- ▶ The Synergistic Effect of Serum-Free Medium with the Corning CellBIND Surface on HEK 293 Cells

- ▶ Enhanced Survival of LNCaP Cells Following Cryopreservation Using the CryoStor™ CS5 Preservation Solution and Corning CellBIND Surface
- ▶ Combining the Corning CellBIND Surface with Commercially Available Enriched Reduced Serum Media, Researchers Can Both Save Money and Have “Happy” Cells

We have provided the conclusions/ helpful hints from each of these Corning CellBIND Surface documents for your convenience.

Corning CellBIND Surface: An Improved Surface for Enhanced Cell Attachment*

http://www.corning.com/Lifesciences/technical_information/techDocs/t_CellBIND_Improved_Surface_CLS_AN_057.pdf

Conclusions

- ▶ Can eliminate the need for biological coatings for cell attachment
- ▶ Enables growth and protein production in low serum
- ▶ Increases adherence and cell yields of fastidious cell lines
- ▶ Enables better cell recovery of primary cell isolates
- ▶ Enables rigorous handling/automation
- ▶ Does not require special storage or handling
- ▶ Requires minimal revalidation by the FDA

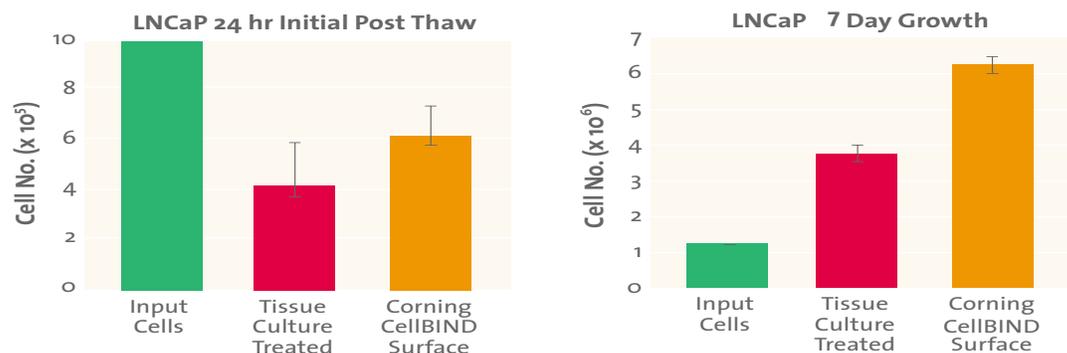


Figure 3. Total cell yield at 24 and 168 hour incubation post thaw under standard conditions. Seeding density 1.0 x 10⁶ cell/ flask. 24 hr data represents average count + SE from three independent experiments.

*From *Corning CellBIND Surface: An Improved Surface for Enhanced Cell Attachment*, Corning publication CLS-AN-057.

Current Corning® CellBIND® Surface Application/Technical Information

Enhanced Attachment of LNCaP Cells to the Corning CellBIND Surface

http://www.corning.com/Lifesciences/technical_information/techDocs/snappshots_cellbindsurface_attachLNCaPcells.pdf



Conclusions

- ▶ On average, 49% more LNCaP cells attached to the Corning CellBIND Surface after 24 hours of culture as compared to a standard tissue culture treated (TCT) surface.
- ▶ Plating of LNCaP cells on the Corning CellBIND Surface results, on average, in 64% greater cell recovery at 7 days as compared to a standard TCT surface.
- ▶ The Corning CellBIND Surface improves the adherent qualities of LNCaP cells, with cells exhibiting a more “spread out” morphology and better uniform distribution than a standard TCT surface.

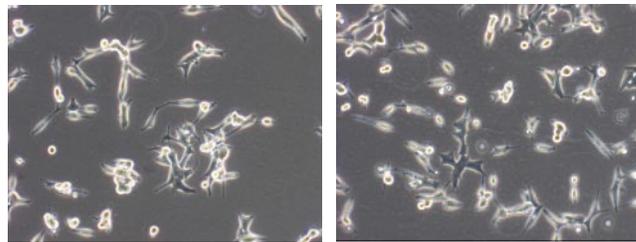


Figure 2. Attachment of LNCaP cells. Cells were thawed and plated onto the Corning CellBIND Surface (right) or tissue culture treated (left) T25 flasks. 24 hours post seeding a random field was viewed by light microscopy (100X magnification).

*From *Enhanced Attachment of LNCaP Cells to the Corning CellBIND Surface*, Corning SnAPPShot publication CLS-AN-048.

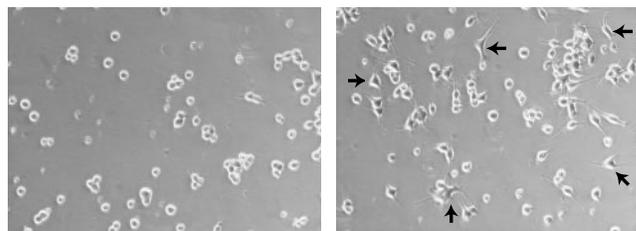
The Synergistic Effect of Serum-Free Medium with the Corning CellBIND Surface on HEK 293 Cells*

http://www.corning.com/Lifesciences/technical_information/techDocs/snappshots_cellbindsurface_hek293cells.pdf



Conclusions

- ▶ Under these serum-free conditions, HEK 293 cells maintain a more normal/flattened adherent morphology on the Corning CellBIND Surface vs. a standard TCT surface.
- ▶ The improved adherence of HEK cells on the Corning CellBIND surface results in 69% more cells at 96 hours as compared to cells grown on standard TCT surfaces.
- ▶ The Corning CellBIND surface yields a greater number of total cells (adherent and nonadherent) during the time course of the study.



Tissue Culture Treated

Corning CellBIND Surface

Figure 1. Representative field of HEK 293 cells grown under serum-free conditions on the Corning CellBIND surface (right) and standard TCT surface (left) at 24 hours. Light micrograph (100X magnification).

*From *The Synergistic Effect of Serum-Free Medium with the Corning CellBIND Surface on HEK 293 Cells*, Corning SnAPPShot publication CLS-AN-049.

Current Corning® CellBIND® Surface Application/Technical Information

Enhanced Survival of LNCaP Cells Following Cryopreservation Using the CryoStor™ CS5 Preservation Solution and Corning CellBIND Surface

http://www.corning.com/Lifesciences/technical_information/techDocs/snappshots_084_Incap_cryostor_cellbind.pdf



Conclusions

- Combining the Corning CellBIND Surface with the BioLife Solutions CryoStor CS5 freezing solution resulted in significant increases in LNCaP cell survival following cryopreservation
- CryoStor CS5 freezing solution combined with the Corning CellBIND surface eliminated the need for proteins or sera in the cryopreservative process, reducing both the costs and the risks associated with using animal-derived sera and proteins.

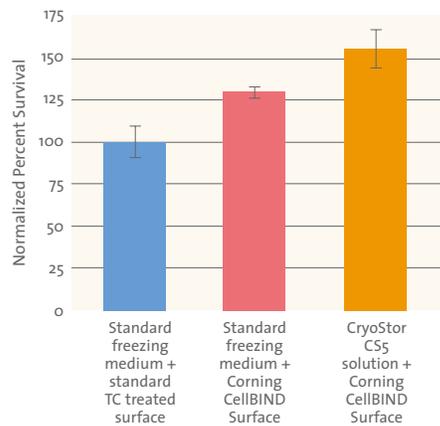


Figure 1. Survival and attachment of cryopreserved LNCaP cells in T25 flasks 24 hours post-thaw. Survival was determined using direct cell counts (hemacytometers) with results normalized to cultures grown under standard conditions (blue column). Data is an average \pm SD of 3 independent experiments performed by Corning scientists (N = 3 repetitions per group).

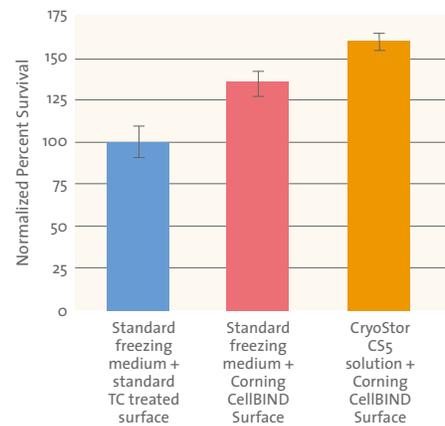


Figure 2. Survival and attachment of cryopreserved LNCaP cells in 96 well plates 24 hours post-thaw. Survival was determined using an almarBlue™ assay and results normalized to cultures grown under standard conditions (blue column). Data is an average \pm SD of 3 independent experiments performed by BioLife Solutions scientists (N = 3 repetitions per group).

*From *Enhanced Survival of LNCaP Cells Following Cryopreservation Using the CryoStor™ CS5 Preservation Solution and Corning CellBIND Surface*, Corning SnAPPShot publication CLS-AN-084.

Reducing Serum Levels and Culture Costs

Combining the Corning® CellBIND® Surface with Commercially Available Enriched Reduced Serum Media, Researchers Can Both Save Money and Have “Happy” Cells.*

http://www.corning.com/Lifesciences/technical_information/techDocs/t_reducing_serum_levels_and_culture_cost_cls_an_074.pdf

Helpful Hints

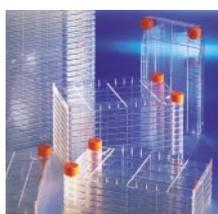
If you are currently using high levels of serum (10% or more), you may be able to reduce your serum use by 50% or more while reducing your overall costs by following these simple suggestions. For better cell attachment and subsequent growth:

1. Try the Corning® CellBIND® Surface to get better cell attachment at lower serum concentrations.
2. Reduce serum levels in several stages, allowing one or two passages at each stage for the cells to adapt, for instance, 10% to 7.5% to 5%.
3. Prewarm medium when initiating cultures to speed up attachment.
4. Pre-equilibrate or pregas culture vessels, especially for larger flasks, roller bottles and Corning CellSTACK® Culture Chambers (Figure 3) to minimize pH increases while cells are initially attaching. The harder it is for cells to initially attach, the more likely there will be uneven attachment and growth.
5. Seed cultures with at least 10,000 to 20,000 cells/cm² as a minimum.
6. If cell attachment or slower growth is a problem, try seeding cells at twice their normal density the first few passages until they fully adapt to the reduced serum medium.
7. Harvest cells gently and quickly to avoid damage to the cell surface so that cells can attach faster. Keep exposure to proteolytic enzymes, such as trypsin, as short as possible.
8. Try centrifuging cells more gently at only a 100 x g for only 5 minutes or just long enough to get a soft pellet that is easy to resuspend without damaging the cells.
9. Make sure the dissociating agent has been inactivated or removed by centrifugation. Trypsin is inactivated by proteins in serum but some activity may remain at very low serum levels.
10. Be patient! It may take several passages in the reduced serum medium for the cells to fully adapt.

*From *Reducing Serum Levels and Culture Costs*, Corning publication CLS-AN-074.



Corning® CellBIND® Surface Product Ordering Information



| Cat. No. | Description | Qty/ Pk | Qty/ Cs |
|------------------------------------|---|------------|------------|
| Roller Bottles | | | |
| 3907 | Roller Bottle, 850 cm ² , Corning CellBIND Surface, Easy Grip Cap, Sterile | 2 | 40 |
| 431134 | Expanded Surface Roller Bottle, 1700 cm ² , Corning CellBIND Surface, Easy Grip Cap, Sterile | 20 | 20 |
| 431329 | Roller Bottle, 850 cm ² , Corning CellBIND Surface, Easy Grip Vent Cap, Sterile | 2 | 40 |
| Flasks | | | |
| 3289 | Flask, 25 cm ² , Corning CellBIND Surface with Vent Cap, Sterile | 20 | 200 |
| 3290 | Flask, 75 cm ² , Corning CellBIND Surface with Vent Cap, Sterile | 5 | 100 |
| 3291 | Flask, 150 cm ² , Corning CellBIND Surface with Vent Cap, Sterile | 5 | 50 |
| 3292 | Flask, 175 cm ² , Corning CellBIND Surface with Vent Cap, Sterile | 5 | 50 |
| 3293 | Flask, 225 cm ² , Corning CellBIND Surface with Vent Cap, Sterile | 5 | 25 |
| 3298 | Flask, 175 cm ² , Corning CellBIND Surface with Phenolic Cap, Sterile | 5 | 50 |
| 431328 | Flask, 175 cm ² , Corning CellBIND Surface, Bar coded with Vent Cap, Sterile | 7 | 84 |
| 431346 | Expanded Surface Flask, 235 cm ² , Corning CellBIND Surface, with Bar Code, Vent Cap, Sterile | 7 | 42 |
| 3068 | RoboFlask™ Tissue Culture Vessel for Automation, 92.6 cm ² growth area, Corning CellBIND Surface, with Bar Code, Septum Cap, Sterile | 10 | 50 |
| 3067 | RoboFlask Tissue Culture Vessel for Automation, 92.6 cm ² growth area, Corning CellBIND Surface, with Bar Code, Septum Cap, Sterile | 20 | 100 |
| 3073 | Low Profile Flask, 100 cm ² , Corning CellBIND Surface with Vent Cap, Sterile | 6 | 60 |
| 10010 | HYPERFlask™ Culture Vessel, 1,720 cm ² , Corning CellBIND Surface with Bar Code | 4 | 4 |
| 10024 | Corning CellBIND Surface HYPERFlask Cell Culture Vessel, Sterile, with Bar Code | 4 | 24 |
| CellSTACK® Culture Chambers | | | |
| 3330 | CellSTACK Chamber, 636 cm ² growth area, Corning CellBIND Surface, 1-STACK, Sterile | 1 | 8 |
| 3310 | CellSTACK Chamber, 1,272 cm ² growth area, Corning CellBIND Surface, 2-STACK, Sterile | 1 | 5 |
| 3311 | CellSTACK Chamber, 3,280 cm ² growth area, Corning CellBIND Surface, 5-STACK, Sterile | 1 | 2 |
| 3312 | CellSTACK Chamber, 6,360 cm ² growth area, Corning CellBIND Surface, 10-STACK, Sterile | 1 | 2 |
| 3320 | CellSTACK Chamber, 6,360 cm ² growth area, Corning CellBIND Surface, 10-STACK, Sterile | 1 | 6 |
| 3321 | CellSTACK Chamber, 25,440 cm ² growth area, Corning CellBIND Surface, 40-STACK, Sterile | 1 | 2 |
| Dishes | | | |
| 3294 | Dish, 35 x 10 mm, Corning CellBIND Surface, Sterile | 10 | 210 |
| 3295 | Dish, 60 x 15 mm, Corning CellBIND Surface, Sterile | 7 | 126 |
| 3296 | Dish, 100 x 20 mm, Corning CellBIND Surface, Sterile | 5 | 40 |

Corning® CellBIND® Surface Product Ordering Information (Continued)



| Cat. No. | Description | Qty/ Pk | Qty/ Cs |
|-----------------------------|--|------------|------------|
| Multiple Well Plates | | | |
| 3335 | 6 Well Plate, Corning CellBIND Surface Clear, Sterile, with Lid | 5 | 50 |
| 3336 | 12 Well Plate, Corning CellBIND Surface Clear, Sterile, with Lid | 5 | 50 |
| 3337 | 24 Well Plate, Corning CellBIND Surface Clear, Sterile, with Lid | 5 | 50 |
| 3338 | 48 Well Plate, Corning CellBIND Surface Clear, Sterile, with Lid | 5 | 50 |
| Microplates | | | |
| 3300 | 96 Well Plate, Corning CellBIND Surface, Clear, Sterile, with Lid | 5 | 50 |
| 3340 | 96 Well Plate, Corning CellBIND Surface, Black/Clear, Sterile, with Lid | 5 | 50 |
| 3683 | 384 Well Plate, Corning CellBIND Surface, Black/Clear, Sterile, with Lid | 10 | 50 |

For additional product or technical information, please visit www.corning.com/lifesciences or call 1.800.492.1110. Customers outside the United States, please call +1.978.442.2200 or contact your local Corning sales office listed below.

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