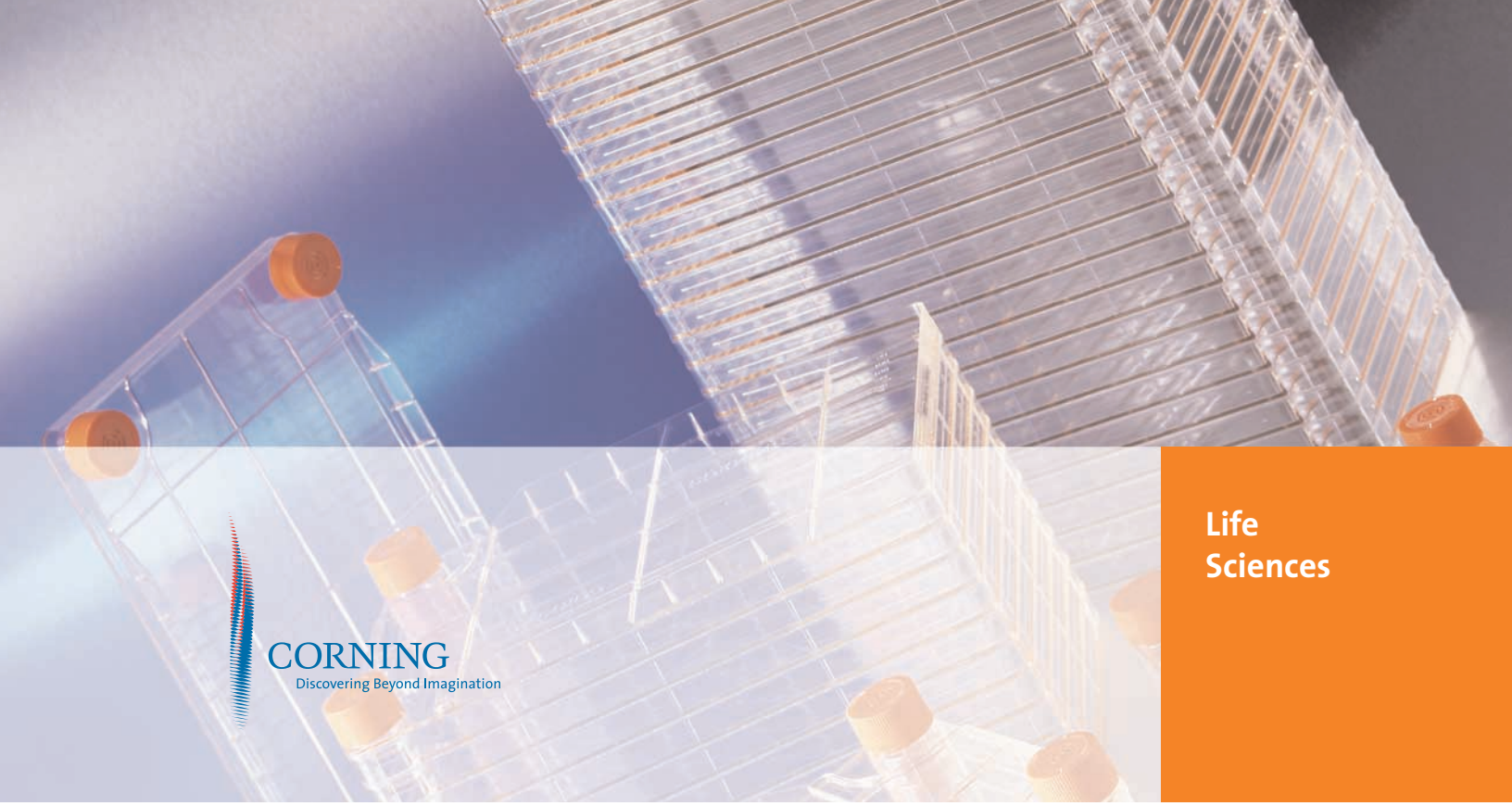

Life Sciences

SnAPPShots

A brief report from the Corning Applications Group

Superior Growth of MDBK Cells in Corning® CellSTACK™-40 Culture Chambers

Todd Upton, Ph.D., Elizabeth M. Martin, and Debra Hoover, Ph.D.

Introduction

Large-scale culture of adherent cells, such as for animal vaccine production, has often required using large numbers of roller bottles. Processing the cells in these bottles is very labor intensive. Corning has developed a scalable culture vessel system, referred to as CellSTACK Culture Chambers, for culturing larger quantities of adherent cells. These are available in a range of sizes from the smallest CellSTACK-1 Chambers with 636 cm^2 of growth surface to the largest CellSTACK-40 Chambers with 25,440 cm^2 of growth surface.

Here, we compare the growth of Madin-Darby bovine kidney (MDBK) cells in Corning CellSTACK-40 Culture Chambers with their growth in a similar competitor product.

Materials and Results

MDBK cells were obtained from ATCC (CCL-22) and grown to 90% confluency in 10-stack chambers from each manufacturer. These were used to inoculate two 40-stack chambers from each manufacturer. Each 40-stack chamber was seeded at 15,000 cells/cm^2. Cells were grown for 72 hours at 37°C in CO_2 independent media (Invitrogen, Grand Island, NY) supplemented with 5% horse serum and penicillin/streptomycin. During harvesting, chambers from each group were washed once with PBS and then treated with trypsin to remove cells. After inactivating the trypsin and removing the trypsinized cells, a second PBS rinse was performed in each chamber to recover remaining cells. All washes were pooled into a single aliquot, centrifuged to pellet cells, resuspended in PBS and enumerated using a hemocytometer. Each experiment was performed three times.

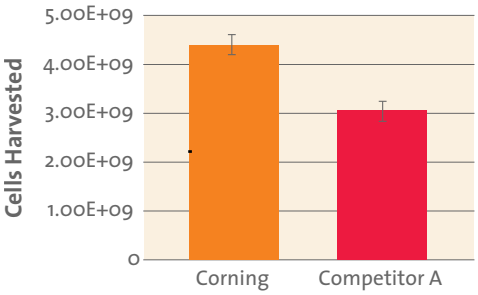

Figure 1. Total MDBK cell recovery from Corning® CellSTACK™-40 Culture Chamber and competitor A. Average ± standard error of at least three independent experiments.

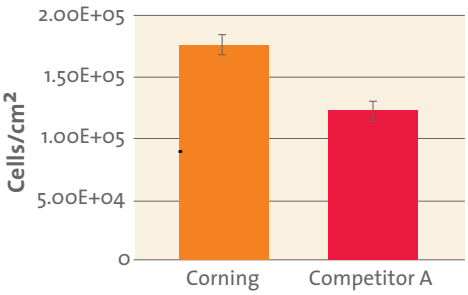

Figure 2. Cells/cm² of MDBK cell recovery from Corning CellSTACK-40 Culture Chamber and competitor A. Average ± standard error of at least three independent experiments.

As shown in Figure 1, a significantly greater amount of cells were harvested from the Corning CellSTACK Culture Chambers as compared to competitor A. When averaged over the 3 experiments, 44% more cells were grown in the Corning CellSTACK-40 Culture Chambers as compared to competitor A. Using a paired two tailed t test this difference in cell yield was found to be highly significant, p value = 0.003. This difference is not attributable to differences in total surface area as there is only a 0.6% difference between the two culture devices (Corning > competitor A). Figure 2 shows that, as expected, there are a greater number of cells per cm^2 in the Corning CellSTACK-40 Culture Chambers as compared to competitor A.

Conclusions

- Corning CellSTACK-40 Culture Chambers grew approximately 44% more MDBK cells than a competitor's 40 stack culture chambers under identical conditions.
- Corning CellSTACK-40 Chambers produced on average 4.38 x 10^9 MDBK cells/chamber, a yield of 1.72 x 10^5 cells/cm^2.

Corning Incorporated
Life Sciences
45 Nagog Park
Acton, MA 01720
t 800.492.1110
t 978.635.2200
f 978.635.2476

www.corning.com/lifesciences

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