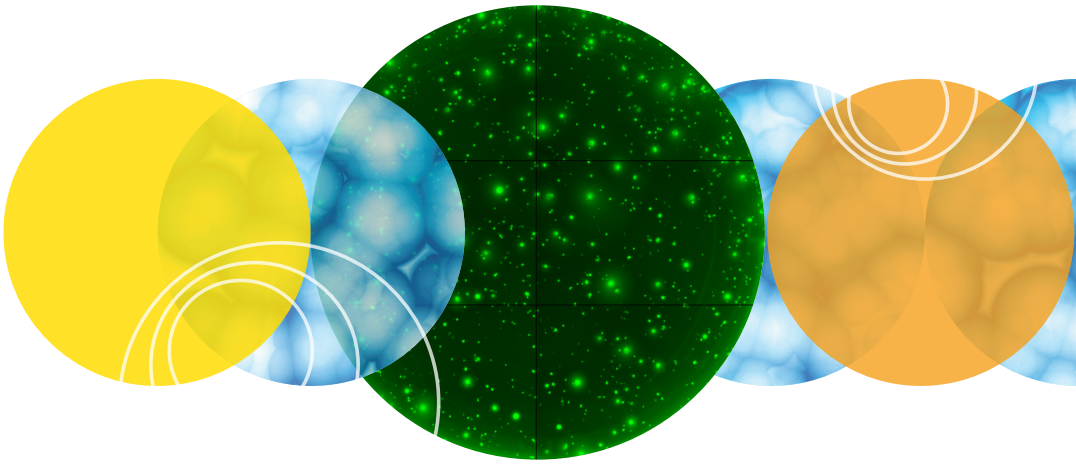

Get to your high-value clones faster with complete CHO media solution

KEY FEATURES

- **Optimized for high recombinant protein production**
- **Chemically defined and free of animal components**
- **Enhanced optical quality for colony imaging**
- **Fast screening and selection of high-value clones**

Introduction

The development of life-saving biotherapeutics such as monoclonal antibodies or other recombinant proteins is key to advancing science. Chinese hamster ovary (CHO) cells are commonly used for industrial production of these proteins. To develop recombinant CHO cell lines, plasmids containing the antibody or protein gene and a selection of marker genes are transfected into CHO cells. The CHO cells are then cultured in media containing selection reagents to promote the growth of only transfected CHO cells. The challenge arises in efficiently cloning and screening thousands of CHO cells to identify clones that exhibit optimal growth and secrete large amounts of the monoclonal antibody or recombinant protein.

Molecular Devices offers a comprehensive, high-throughput colony picking and screening technology that, together with optimally-formulated media, maximizes productivity and minimize hands-on time for discovering and developing stable CHO cell lines. The ClonePix™ 2 System, a mammalian colony picker, allows for fluorescent screening and picking of high-producing CHO cells when a fluorescently-labeled antibody, such as FITC-labeled CloneDetect™ Antibody, is added to the media. CloneSelect™ Imager, a label-free imaging system, allows for objective, quantitative assessment of cell growth and monoclonality verification, ensuring that only stable clonal cell lines are selected for downstream studies. The XP Media™ CHO Growth A and CloneMedia™ CHO Growth A offer a robust method for culturing, cloning and screening CHO cells on these systems as well as on other platforms.

MOLECULAR DEVICES

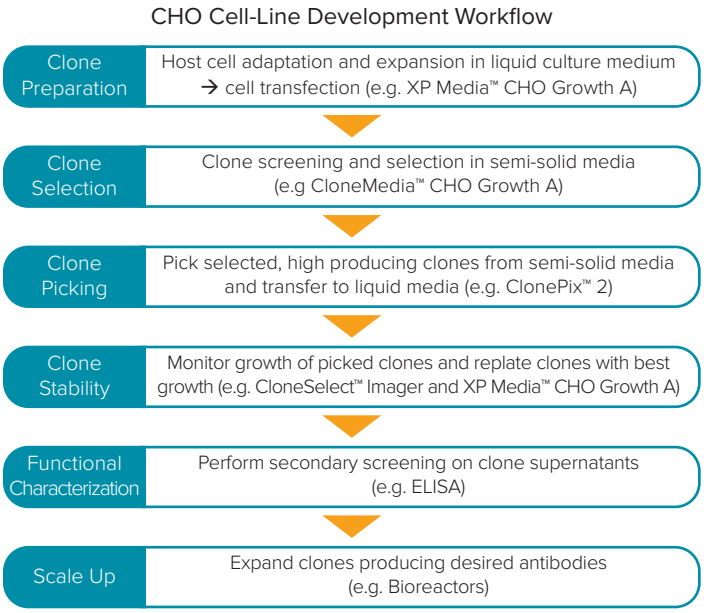

Figure 1: Overview of the CHO cell-line development workflow. XP Media CHO Growth A, CloneMedia CHO Growth A, and CloneDetect together with industry-proven ClonePix 2 System and CloneSelect Imager technologies improve efficiency of isolating high-value clones faster.

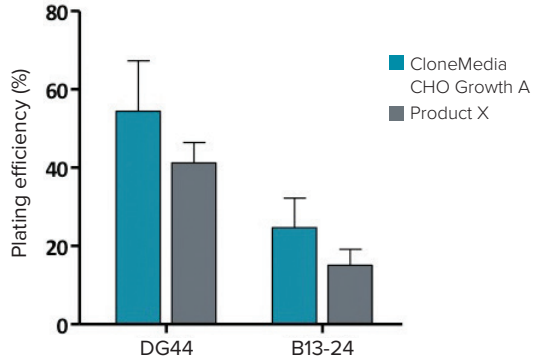

Figure 2: Plating efficiency (%) of CHO cells grown in CloneMedia CHO Growth A or Product X. The CHO cells were imaged on the CloneSelect Imager and the plating efficiency was calculated using CloneSelect Imager's Loci Count feature. The CloneMedia CHO Growth A media shows higher plating efficiency than Product X.

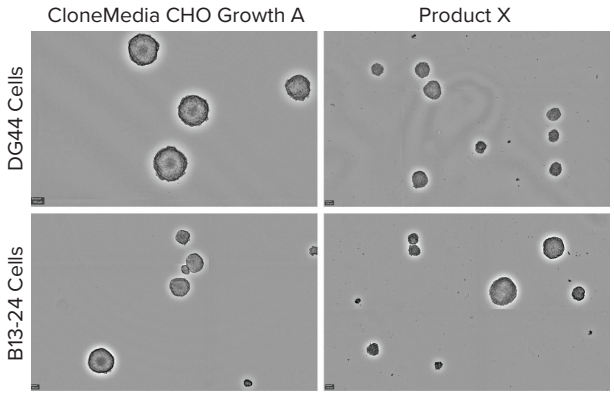

Figure 3: DG44 and B13-24 cells cultured in different semi-solid media. CloneMedia CHO Growth A has superior methylcellulose quality than Product X which provides better optical clarity. CloneMedia CHO Growth A background is clean while Product X has debris present.

Faster cloning with CloneMedia CHO Growth A

Limiting dilution or fluorescence-activated cell sorting (FACS) is traditionally used to clone CHO cells. These methods can be inefficient as they may require additional rounds of sub-cloning to obtain a high probability of monoclonality. The CloneMedia CHO Growth A is a viscous semi-solid media that immobilizes single CHO cells, allowing them to grow and form distinct, clonal colonies resulting in the reduction or elimination of additional sub-cloning steps.

In Figure 1, a general CHO cell-line development workflow is shown with examples of where Molecular Devices products can be used.

Superior growth and optical clarity

CloneMedia CHO Growth A contains supplements to promote the growth of different CHO cell lines such as DG44 and B13-24 cells as seen in Figure 2.

The optical clarity of CloneMedia CHO Growth A provides high quality images for publications and facilitates monoclonality verification and colony identification for picking (Figure 3).

Significant time savings with high-throughput fluorescence screening

The addition of a fluorescently-labeled antibody such as FITC-labeled CloneDetect to CloneMedia CHO Growth A allows for fluorescent screening and selection of high-secreting CHO cells. After the ClonePix 2 System fluorescently images cells as seen in Figure 4A, colonies can be ranked and picked based on the level of detected secreted protein. This allows the ClonePix 2 System to select only the highest expressors amongst the thousands of colonies, which greatly reduces cell-line development workload by decreasing the number of colonies for downstream screening.

Greater antibody production

The colonies picked by the ClonePix 2 System can then be grown in cell culture plates containing XP Media CHO Growth A with L-Gln. By using Molecular Devices comprehensive CHO media products, CHO cells cultured in CloneMedia CHO Growth A and XP Media CHO Growth A have superior antibody productivity compared to the CHO media offerings offered by another vendor as shown in Figure 4C.

XP Media CHO Growth A supports the initial growth of CHO cell cultures as well as the recovery and expansion of CHO cells following colony picking from ClonePix systems. XP Media CHO Growth A is formulated to maximize antibody production. While the mean growth rates of XP Media CHO Growth A for DG44 and B13-24 cells are similar to other vendors' CHO media (Figure 5A and 5B), the antibody productivity of XP Media CHO Growth A is significantly greater than other vendors' CHO media (Figure 5C and 5D). The development and proliferation of high-secreting clones enables more efficient workflows by increasing the number and quality of candidates passed on to scale up.

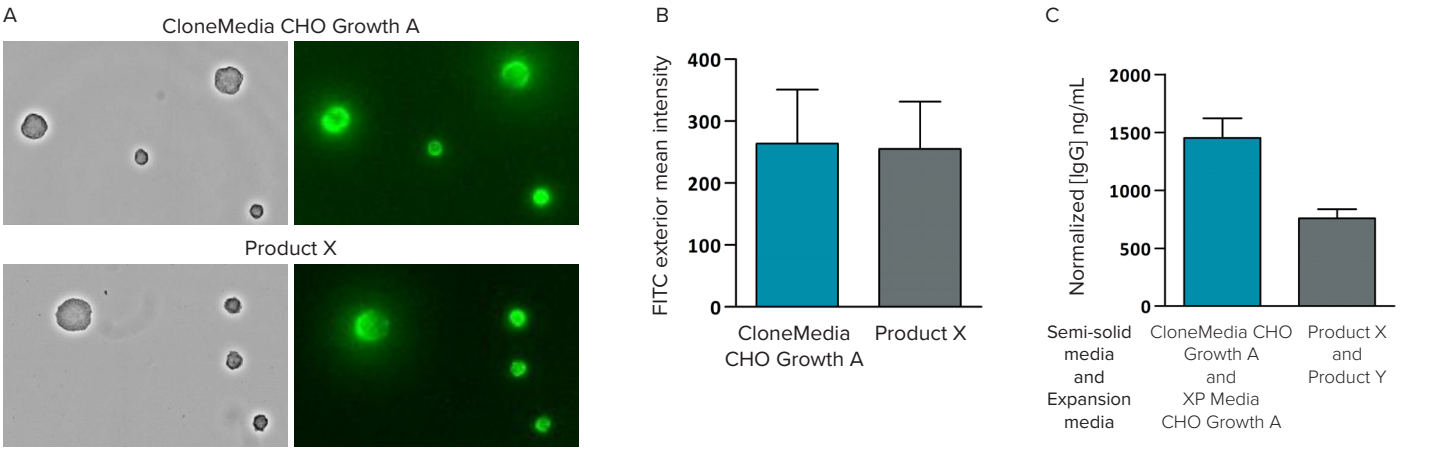

Figure 4: Suspension-adapted CHO B13-24 cells grown using CHO semi-solid and liquid media from Molecular Devices and another vendor. **(A)** Images captured with CloneSelect Imager (white light) and ClonePix 2 System (fluorescence) after 12 days growth in CloneMedia CHO Growth A with L-Gln or in Product X**.** IgG secretion was fluorescently detected using CloneDetect Human IgG, fluorescein. **(B)** The ClonePix 2 System software was used to determine the FITC exterior mean intensity of colonies which was one of the parameters used to select the colonies to pick. **(C)** Colony antibody productivity was determined by performing ELISA on clone supernatants 10 days after picking. Values are normalized to 100% confluence. Molecular Devices media products are compared to another vendor's products.

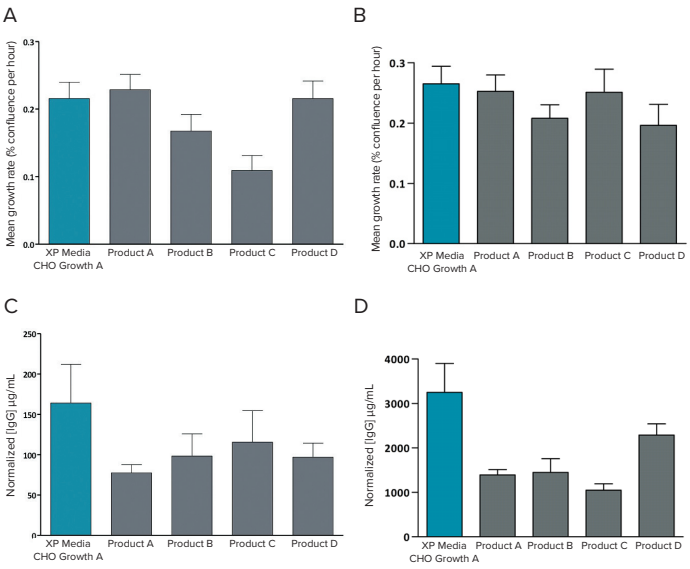

Figure 5: Comparison of liquid CHO media from different vendors. The post-pick recovery and productivity of suspension DG44 and B13-24 cells 10 days after picking is shown. The mean growth rates of DG44 **(A)** and B13-24 **(B)** cells grown in XP Media CHO Growth A are similar to or better than the CHO media from other vendors. However, the antibody productivity (normalized to 100% cell confluence) of DG44 **(C)** and B13-24 **(D)** cells grown in XP Media CHO Growth A is up to 2 to 3 times greater than other vendors' CHO media.

Summary

Molecular Devices provides a fast, simple and comprehensive solution for CHO cell-line development. When used together, XP Media CHO Growth A, CloneMedia CHO Growth A, CloneDetect, CloneSelect Imager, and ClonePix 2 System enable researchers to more efficiently develop new protein-producing CHO cells lines, thus accelerating time to market.

Product	Description	Catalog #
CloneMedia CHO Growth A without L-Gln	1 x 90 mL	K8840
CloneMedia CHO Growth A without L-Gln	6 x 90 mL	K8830
ClonePix 2 System	High-throughput screening and objective selection system for mammalian cells	Contact Us
CloneSelect Imager	Label-free imaging system for objective and quantitative assessment of cell growth and monoclonality verification	Contact Us

Contact Us

Phone: +1-800-635-5577
Web: www.moleculardevices.com
Email: info@moldev.com
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