Solentim

Elevate Cell Line Development with InstiGRO™, InstiSHAKE™, and InstiTHAW™ Supplements

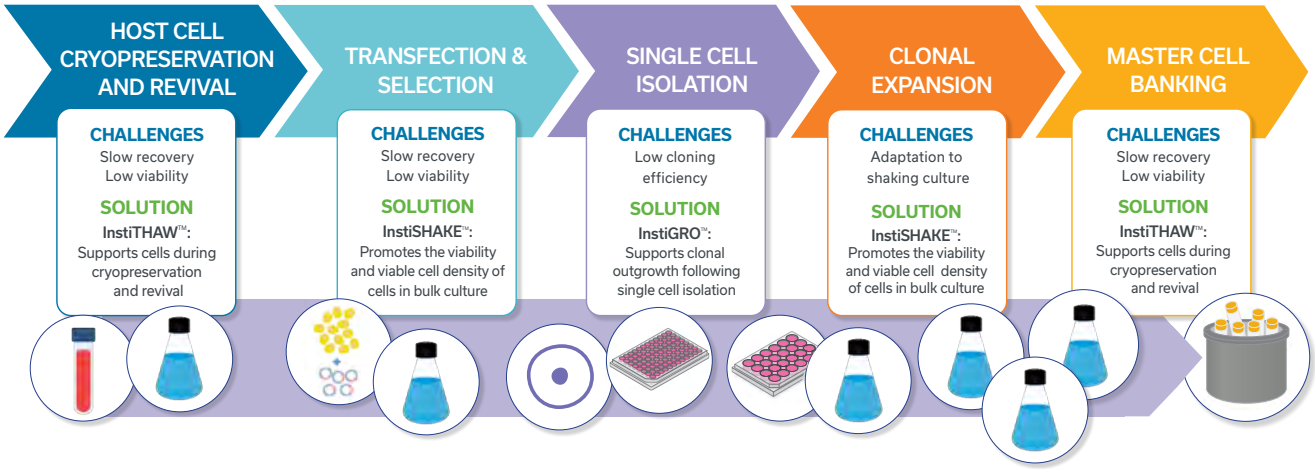
Empower your research with superior growth and performance

ADVANCED INSTRUMENTS

Revolutionizing Cell Line Development

The demand for protein therapeutics has soared since their introduction, driving the need for improved production methods which ensure both higher capacity and consistent product quality. However, developing stable cell lines for protein therapeutics remains a challenge due to numerous limitations in cell culture practices. Revival and transfection often involve exposure to different environmental conditions, such as changes in temperature, osmolarity, or chemical exposure, which can stress the cells. Moreover, the process of isolating single cells for regulatory approval can be intricate and may subject the cells to mechanical stress or other factors that can affect their health. Finally, the expansion of clones to shaking culture for scalable manufacture subjects cells to shear forces which can affect the cells' health, and productivity.

Advanced Instruments proudly offers a suite of animal component free (ACF) cell growth supplements tailored for Chinese Hamster Ovary (CHO) cells. The **InstiTHAW, InstiGRO**, and **InstiSHAKE** cell culture supplements have been carefully crafted to protect, nurture, and support the development of stable cell lines, ensuring unparalleled growth and performance. **InstiTHAW CHO** protects cells during cryopreservation and revival, while **InstiGRO CHO** and **InstiGRO CHO PLUS** assists with early cell growth following single cell isolation. **InstiSHAKE CHO** also supports expansion of clones to shaking culture conditions, paving the way for scalable production of protein therapeutics.



InstiTHAW

- **Improves host cell revival**
  Allows cell line development campaigns to commence with hast following host cell revival.

- **Instils confidence in master cell banks**
  Protects cells during cryopreservation and revival, providing assurance when it comes to generating master cell banks.

- **Easy to use**
  Simply add to your cell suspension during cryopreservation, and at the time of revival.

InstiGRO

- **Enhances clonal outgrowth**
  Provides single cells with the crucial components required to develop into healthy clonal colonies.

- **Compatible with whole well imaging for regulatory approval**
  Capturing high resolution images for Investigational New Drug applications is crucial. InstiGRO promotes single cell growth while preserving optical clarity.

- **Easy to use**
  Simply add to your cloning medium before single cell seeding.

InstiSHAKE

- **Supports clonal expansion**
  Protects cells as they transition from static to shaking culture vessels, enabling scalable manufacture.

- **Heightens fed batch performance**
  Nurtures the viability and viable cell density of cells as they undergo fed batch studies.

- **Easy to use**
  Simply add to your cell growth medium.

InstiTHAW: Elevating cryopreservation and revival

Ensuring optimal viability and viable cell density throughout cryopreservation and revival poses a considerable hurdle. Without a reliable solution, these challenges can stall the progression towards developing stable cell lines. **InstiTHAW CHO** provides a robust ACF solution for pharmaceutical companies. The supplement serves as a crucial support system for host cell lines, enabling transfection to commence with hast following their revival. Moreover, **InstiTHAW CHO** instills confidence when it comes to generating master cell banks by ensuring seamless cryopreservation and revival processes.

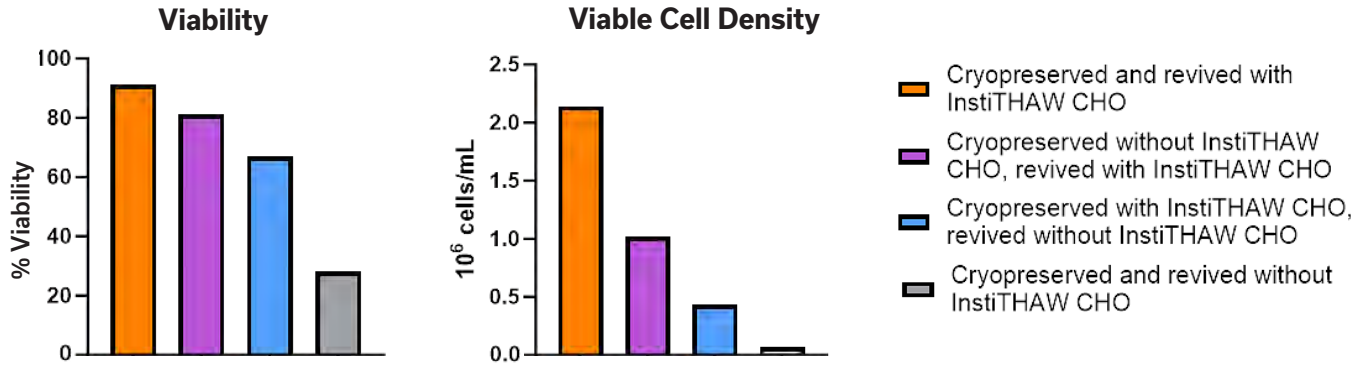


Figure 1. Shows the viability (%) and viable cell density (cells/mL) of CHO-S cells on day 6 post revival.

InstiGRO: Amplifying clonal outgrowth

Encouraging cells to divide and generate healthy colonies following single cell isolation can be a major challenge in stable cell line development. Scientists often resort to seeding numerous microplates, to achieve the required number of clones for screening, raising project costs and timelines. Whilst Conditioned Medium can be used to enhance cloning efficiencies, its application often adds variability to workflows due to limited control over its manufacture.

Advanced Instruments' **InstiGRO CHO** and **InstiGRO CHO PLUS** offer consistent support for single cells to promote the growth of healthy clonal colonies. They're effortlessly integrated—simply add them to the cell culture medium and begin single cell seeding.

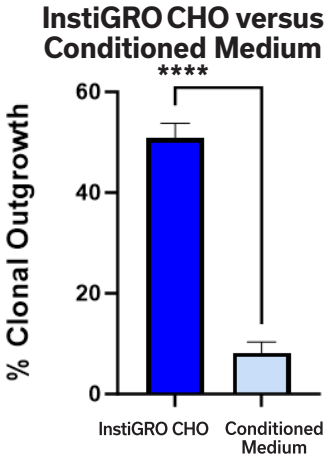


Figure 2. A CHO-K1 cell line expressing a monoclonal antibody was single cell seeded. The average percentage clonal outgrowth per plate was calculated following VIPS seeding with InstiGRO CHO PLUS and Conditioned Medium (n=5). Error bars show the standard deviation between the number of clonal colonies per plate. Statistical significance between conditions is indicated by asterisks (*). T test P values indicate statistical significance (**** $P < 0.0001$).

InstiGRO CHO and InstiGRO CHO PLUS

InstiGRO CHO and **InstiGRO CHO PLUS** both promote clonal outgrowth. The answer to the difference between the two is the formulation – While InstiGRO CHO and InstiGRO CHO PLUS are both ACF supplements, their compositions differ slightly to allow support for different CHO cell lines used to manufacture protein therapeutics.

InstiSHAKE: Empowering clonal expansion and performance under shaking culture conditions

Expanding clones to shaking vessels allows cells to be grown at higher densities, enabling increased yields of protein therapeutics. Unfortunately, shear stress associated with shaking conditions often has a negative impact on the viability and viable cell density of cells, resulting in reduced productivity.

The **InstiSHAKE CHO** supplement is a game-changer in the transition from static to shaking culture conditions. The supplement safeguards cells, paving the way for scalable development of protein therapeutics.

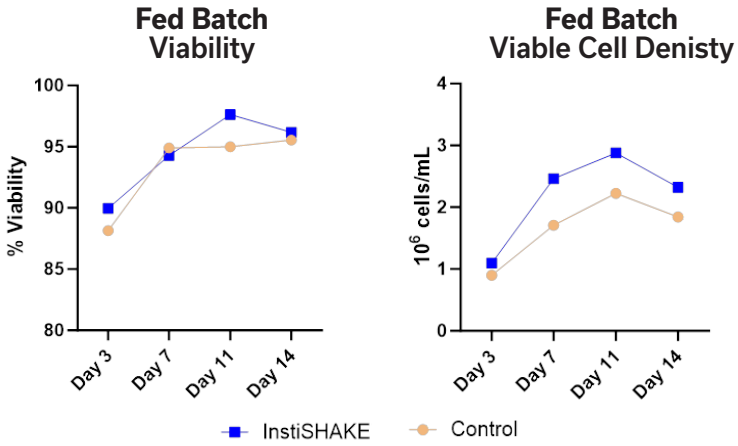


Figure 3. Shows the average viability (%) and viable cell density (cells/mL) of 19 clones which underwent a fed batch study in the presence of InstiSHAKE CHO, and 18 control clones.

Figure 4. Shows the number of clones which were successfully expanded from static to shaking culture. Of the successfully expanded clones, those which suffered with low viable cell density (<0.7×10^{6}cells/mL) are presented. The total number of clones lost is also presented.

InstiGRO + VIPS® PRO: Unlocking potential

VIPS PRO is an automated single cell seeder and whole well imaging system which dispenses single cells and captures high-quality whole well images to provide assurance of clonality. The system enhances single seeding efficiencies and is pivotal in supporting Investigational New Drug applications.

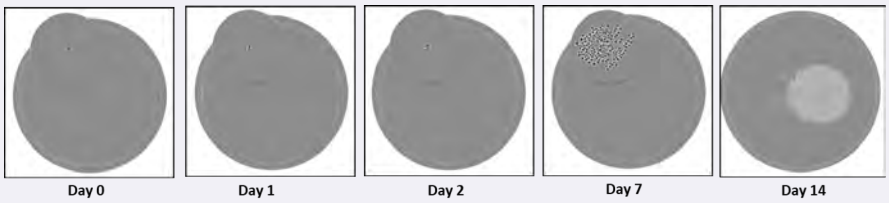
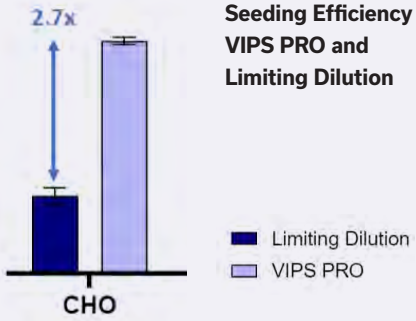


Figure 6. Whole well Images captured by VIPS PRO.



Seeding Efficiency VIPS PRO and Limiting Dilution

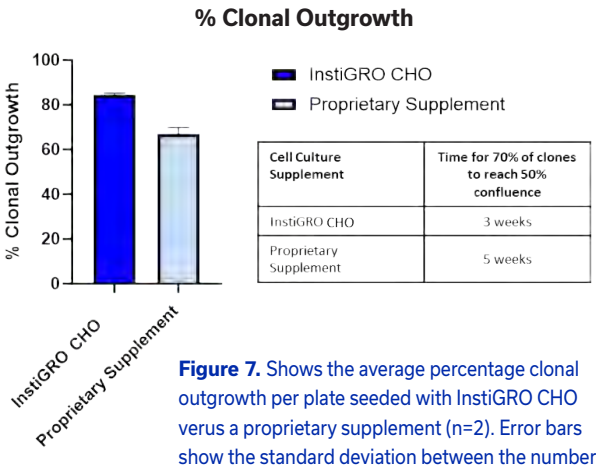
Figure 5. Shows the efficiency of VIPS PRO seeding versus limiting dilution

Pairing VIPS PRO's high throughput seeding and imaging capabilities with InstiGRO's ability to support single cell outgrowth unlocks a new level of potential. The result? Reduced project costs and timelines, empowering scientists to achieve their goals more efficiently than ever before.

Customer Testimony:

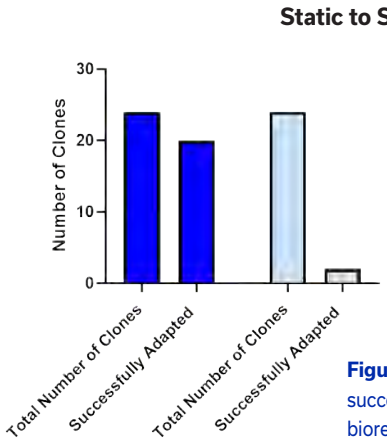
'We use InstiGRO CHO to improve the efficiency of our cloning projects. The supplement has helped us achieve clonal outgrowth >80% and has reduced the time taken for clones to reach our desired confluence by 2 weeks! During expansion, we use InstiSHAKE CHO to support the adaptation of our clones to shaking culture. Thanks to InstiSHAKE CHO, we have significantly reduced the number of clones lost (by 90%) and have reduced the amount of time taken for cells to reach our desired viable cell density and viability by 7 days. Taken together, the combined use of InstiGRO CHO and InstiSHAKE CHO can accelerate our CLD workflow up to 3 weeks.'

CHO+Plus



Cell Culture Supplement	Time for 70% of clones to reach 50% confluence
InstiGRO CHO	3 weeks
Proprietary Supplement	5 weeks

Figure 7. Shows the average percentage clonal outgrowth per plate seeded with InstiGRO CHO verus a proprietary supplement (n=2). Error bars show the standard deviation between the number of clonal colonies per plate. The time taken for 70% of colonies to reach 50% confluency from single cells is also reported in weeks.



Expansion Conditions	Time taken for clones to reach $3x10^6$ cells/mL and >85% viability
InstiSHAKE CHO	10 days
Negative Control	17 days

Figure 8. Shows the number of clones which were successfully adapted from 24 well static to 50mL bioreactors with and without InstiSHAKE CHO. The time following expansion for clones to reach a viable cell density of 3×10^6 cells/mL, and viability >85% is also reported in days.

Application Note:

Single-cell seeding conditions for improved colony outgrowth

"Cloning efficiency (colony outgrowth) is often over-looked in cell line development workflows, with processes concentrating more on the single-cell isolation step. However, the recovery and growth of single cells are widely recognized a challenging step in the process."

"For this experiment, four main factors were considered as key features of high cloning efficiency: the single-cell seeding method, basal cell culture media, media supplements, and inherent pool differences."

"Combining VIPS and InstiGRO CHO products dramatically and consistently increased the percentage of clonal outgrowth achieved in these experiments."

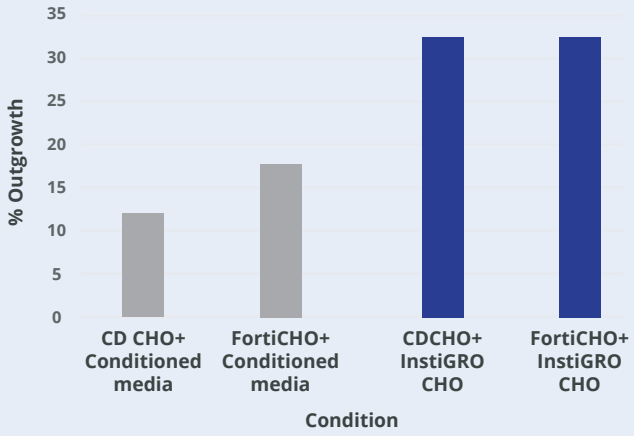


Figure 9. Shows the average clonal outgrowth achieved when CD CHO and FortiCHO were supplemented with Conditioned Medium versus InstiGRO CHO

Learn more

Products

Product Code	Product Name	Product Size (mL)
InstiGRO		
RS-1105	InstiGRO CHO	5
RS-1125	InstiGRO CHO	25
RS-1205	InstiGRO CHO PLUS	5
RS-1225	InstiGRO CHO PLUS	25
RS-3105	InstiTHAW CHO	5
InstiSHAKE		
RS-2125	InstiSHAKE CHO	Sol A - 20 & Sol B - 5
InstiTHAW		
RS-3105	InstiTHAW CHO	5

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