CHO

603479

GENERAL INFORMATION

Description

Chinese hamster ovary (CHO) cells are a cornerstone in the field of biotechnology and are heavily utilized in the process of CHO cell line development for the manufacture of biopharmaceuticals. These include monoclonal antibodies, recombinant antibody expression, and vaccines. The many advantages of CHO cells underscore their popularity in biomanufacturing, positioning them as a robust and versatile animal cell line with a proven track record in genetics, molecular biology, toxicity screening, nutrition, and gene expression studies.
The contribution of CHO cells to the biopharmaceutical industry is immense, with their role in the development of recombinant antibodies and monoclonal antibody production being particularly significant. Nearly 50 biotherapeutics developed using these cells have been approved in the USA and EU, which speaks to the efficacy of CHO cells and their integral role in antibody development. Their hamster origin contributes to lower susceptibility to viruses, enhancing biosafety in biomanufacturing settings and reducing batch-to-batch variation.
CHO cells are well-suited to produce proteins that undergo post-translational modifications, which is critical for therapeutic protein production. The versatility of the Chinese Hamster Ovary-derived cells is further highlighted by their fast proliferation rates and high protein expression rates of 1-5 grams per liter of culture. The ease of cultivating CHO cells and their ability to be genetically modified makes CHO cells an optimal choice for both transient and stable expression studies.
The CHO-K1 cell line, a derivative of the original Chinese hamster ovary (CHO) cells is frequently utilized in expressing recombinant proteins, especially for the production of therapeutic proteins and recombinant antibodies. They excel in producing therapeutic proteins and antibodies due to efficient post-translational modification, notably glycosylation. Researchers modify CHO-K1 cells to enhance protein expression and tailor glycosylation for specific therapies, crucial in biomedicine.
In conclusion, the Chinese hamster ovary cell line, known for its remarkable ability to mimic human post-translational modifications, is an invaluable scientific resource. Whether overcoming the difficulty of expressing challenging proteins or monoclonal antibody production, CHO cells have revolutionized the development and production of recombinant protein therapeutics. They remain pivotal in modern medicine, serving as a cornerstone for biopharmaceutical production and reflecting the advancements in biotechnology.

Tissue	Ovary

Applications

This cell line is an optimal choice for toxicology, industrial biotechnology and bioproduction.

Synonyms

- Chinese Hamster Ovary
- CHO-ori

CLASSIFICATION

Organism	Chinese hamster
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like

IDENTIFIERS

Citation

CHO (Cytion catalog number 603479)

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NCBI TaxID	10029
Cellosaurus	CVCL_0213

HANDLING AND CULTURE

Culture medium

Ham's F12, w: 1.0 mM stable Glutamine, w: 1.0 mM Sodium pyruvate, w: 1.1 g/L NaHCO3 (Cytion article number 820600a)

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase

Subculturing

Remove the old medium from the adherent cells and wash them with PBS that lacks calcium and magnesium. For T25 flasks, use 3-5 ml of PBS, and for T75 flasks, use 5-10 ml. Then, cover the cells completely with Accutase, using 1-2 ml for T25 flasks and 2.5 ml for T75 flasks. Let the cells incubate at room temperature for 8-10 minutes to detach them. After incubation, gently mix the cells with 10 ml of medium to resuspend them, then centrifuge at 300xg for 3 minutes. Discard the supernatant, resuspend the cells in fresh medium, and transfer them into new flasks that already contain fresh medium.

Seeding density	3 x 10^4 cells/cm^2 will yield in a confluent layer in about 4 days
Fluid renewal	2 to 3 times per week
Post-thaw recovery	After thawing, plate the cells at 5 x 10^4 cells/cm^2 and allow the cells to recover from the freezing process and to adhere for at least 24 hours.

Thawing and culturing

Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit.
Upon receipt, either store the cryovial immediately at temperatures below -150°C to ensure the preservation of cellular integrity, or proceed to step 3 if immediate culturing is required.
For immediate culturing, swiftly thaw the vial by immersing it in a 37°C water bath with clean water and an antimicrobial agent, agitating gently for 40-60 seconds until a small ice clump remains.
Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
Carefully open the disinfected vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of room-temperature culture medium, mixing gently.
Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
Gently resuspend the cell pellet in 10 ml of fresh culture medium. For adherent cells, divide the suspension between two T25 culture flasks; for suspension cultures, transfer all the medium into one T25 flask to promote effective cell interaction and growth.
Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

QUALITY CONTROL AND CRYOPRESERVATION

Sterility

Mycoplasma contamination is excluded using both PCR-based assays and luminescence-based mycoplasma detection methods.
To ensure there is no bacterial, fungal, or yeast contamination, cell cultures are subjected to daily visual inspections.

Freeze medium	As a cryopreservation medium, we use complete growth medium (including FBS) + 10% DMSO for adequate post-thaw viability, or CM-1 (Cytion catalog number 800100), which includes optimized osmoprotectants and metabolic stabilizers to enhance recovery and reduce cryo-induced stress.

Storage conditions

For long-term preservation, place vials in vapor-phase liquid nitrogen at about −150 to −196 °C. Storage at −80 °C is acceptable only as a short interim step before transfer to liquid nitrogen.

Shipping conditions

Cryopreserved cell lines are shipped on dry ice in validated, insulated packaging with sufficient refrigerant to maintain approximately −78 °C throughout transit. On receipt, inspect the container immediately and transfer vials without delay to appropriate storage.

DONOR

Donor age	Adult

LEGAL AND SAFETY

Safety precautions

When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

Disclaimer

Our cells are provided for in vitro laboratory research purposes exclusively and are not intended for clinical or diagnostic use, nor are they to be administered to humans or used for veterinary purposes. Users must adhere to all applicable guidelines and regulations for the handling and use of these cells in a research setting.

Warranty

At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

Material Transfer Agreement required	Yes