FRTL-5

500407

GENERAL INFORMATION

Description

The FRTL-5 cell line, derived from normal rat thyroid follicular cells, plays a significant role in thyroid research, particularly focusing on the physiology and pathophysiology of the gland. These cells are characterized by their dependence on thyroid-stimulating hormone (TSH) for proliferation, making them an essential model for studying TSH regulation and thyroid hormone biosynthesis. Importantly, FRTL-5 cells retain the capability to uptake iodide, which is crucial for investigating iodide metabolism and the production of thyroid hormones. This feature underscores their utility in exploring thyroid function and dysfunctions.
In addition to their fundamental roles in thyroid hormone studies, FRTL-5 cells have been instrumental in examining the influence of growth factors, cytokines, and oncogenes on thyroid biology. Their consistent expression of thyroid-specific markers, including thyroglobulin and thyroperoxidase, makes them valuable for molecular and cellular biology studies aimed at understanding thyroid-related diseases. As such, FRTL-5 cells are frequently utilized in research addressing thyroid cancer, autoimmune thyroid disease, and other related disorders, contributing significant insights into the cellular mechanisms driving these conditions.
Moreover, the FRTL-5 cell line has been critical in research related to autoimmune thyroid disorders such as Graves' disease. It has been used to assay the activity of immunoglobulins in human samples, offering a robust and reproducible model for studying autoimmune interactions with thyroid cells. The three-dimensional growth pattern of these cells provides a more physiologically relevant environment for examining cell behavior and intercellular interactions in thyroid biology. These attributes, combined with decades of research leveraging FRTL-5 cells, underscore their importance in advancing our understanding of thyroid health and disease.

Tissue	Thyroidea

Synonyms

- FRTL 5
- FRTL5
- FRTL-5 Cl 2

CLASSIFICATION

Organism	Rat
Sex	Unspecified
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Doubling time	30-34 hours

IDENTIFIERS

Citation

FRTL-5 (Cytion catalog number 500407)

NCBI TaxID	10116
Cellosaurus	CVCL_0265

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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 5% FBS, 10 mg/L Insulin, 5 mg/L Transferrin, 50 microgram/L Hydrocortison, 10 microgram/L Somatostatin, 10 microgram/L Gly-His-Lsy-acetate, 0.0165 microgram/mL bovine TSH (catalog number T1614 from Scripps Laboratories) - Add the required TSH just before use and sterile filter into the medium.

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.

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

Breed / subspecies	Fischer
Donor age	6 weeks

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

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