Product sheet

FRTL-5 Cells | 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.
Organism	Rat
Tissue	Thyroidea
Synonyms	FRTL 5, FRTL5, FRTL-5 Cl 2

Characteristics

Breed/Subspecies	Fischer
Age	6 weeks
Gender	Unspecified
Growth properties	Adherent

Regulatory Data

Citation	FRTL-5 (Cytion catalog number 500407)

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Biosafety level	1
NCBI_TaxID	10116
CellosaurusAccession	CVCL_0265

Biomolecular Data

Handling

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)
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
Doubling time	30-34 hours
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.
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.

Thawing and Culturing Cells	1. Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit. 2. 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. 3. 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. 4. Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening. 5. 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. 6. Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium. 7. 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. 8. Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.
Incubation Atmosphere	37°C, 5% CO_2, humidified atmosphere.
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.
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.

Quality Control & Molecular Analysis

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.