

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

Age 6 weeks

Gender Unspecified

Growth properties Adherent

Identifiers / Biosafety / Citation

Citation FRTL-5 (Cytion catalog number 500407)

Biosafety level 1

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Expression / Mutation

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)

Medium supplements Supplement the medium with 10% 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.

Passaging solution 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 CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

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Handling of cryopreserved cultures

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 $300 \times g$ for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium. Optionally, skip centrifugation but remove any remaining freezing medium after 24 hours.
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.

Quality control / Genetic profile / HLA

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.

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STR profile

Rat_D1Wox31: 104
Rat_D2Wox37: 150
Rat_D19Wox11: 212
Rat_D10Wox8: 266
Rat_D4Wox7: 153
Rat_D2Wox27: 211
Rat_D5Rat33: 136
Rat_D10Wox11: 165
Rat_D1Wox23: 210
Rat_D12Wox1: 402
Rat_D6Wox2: 112
Rat_D8Wox7: 182
Rat_D6Cebr1: 233
SRY: x,Y