Product sheet

FRTL-5 Cells | 500407

General information

Description	FRTL-5 cells, derived from the thyroid glands of Fischer rats aged 5 to 6 weeks, offer a remarkable resource for researchers in biological science. This clonal line of continuously cultured FRTL cells has gained recognition for maintaining highly differentiated thyroid features, including thyroglobulin secretion and iodide concentration. Unlike other cell lines, FRTL-5 cells tend to grow in intricate three-dimensional structures rather than forming a monolayer, providing a unique model for studying thyroid cell behaviour. FRTL-5 cells have been employed as assays to measure the stimulatory activity of human autoimmune immunoglobulins found in patients with Graves' disease, a common thyroid disorder. Their consistent performance, high reproducibility, and diagnostic accuracy have made them a preferred choice for such studies for over 30 years. The breakthroughs achieved using FRTL-5 cells are worth highlighting. Three decades ago, the esteemed Kohn group pioneered a bioassay based on these cells, exhibiting exceptional reproducibility, feasibility, and diagnostic precision. Through this innovative approach, Kohn and colleagues achieved a significant milestone by developing monoclonal antibodies (moAbs) explicitly targeting the thyroid-stimulating hormone receptor (TSHR). This groundbreaking accomplishment shed light on the multifaceted functional nature of thyroid receptor antibodies (TRAbs) in individuals with Graves' disease. Notably, their research unveiled not only stimulating and blocking TRAbs but also antibodies that activated alternative pathways beyond the traditional cyclic adenosine monophosphate (cAMP) pathway. The applications of FRTL-5 cells extend far beyond their pivotal role in deciphering the complexities of Graves' disease. Researchers have relied on these cells to explore the inner workings of thyroid cells, studying hormone dependency and secretion mechanisms. Their unique ability to maintain the characteristics of differentiated thyroid cells provides an invaluable platform for investigating the intricate processes that govern thyroid function.
Organism	Rat
Tissue	Thyroidea
Synonyms	FRTL 5, FRTL5, FRTL-5 Cl 2

Characteristics

Age	6 weeks
Gender	Unspecified
Growth properties	Adherent

Identifiers / Biosafety / Citation

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Citation	FRTL-5 (Cytion catalog number 500407)
Biosafety level	1

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 TSH (from Scrippslabs) - Add the required TSH just before use and sterile filter into the medium.
Passaging solution	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.
Freeze medium	CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

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 x 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