

FRTL-5 growing culture | 550407

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

Citation FRTL-5 (Cytion catalog number 500407)

Biosafety level 1

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Expression / Mutation

Handling

Culture Medium	Ham's F12
Medium supplements	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, 33 mg/L TSH (Scripps labs) - Always add the appropriate amount of TSH just before use and filter sterilely into the medium, w: 1.0 mM stable Glutamine, w: 1.0 mM Sodium pyruvate, w: 1.1 g/L NaHCO ₃
Passaging solution	Accutase
Freeze medium	CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)
Handling of cryopreserved cultures	The cells come deep-frozen shipped on dry ice. Please make sure that the vial is still frozen. If immediate culturing is not intended, the cryovial must be stored below -150 degree Celsius after arrival. If immediate culturing is intended, please follow the below instructions: Quickly thaw by rapid agitation in a 37 degree Celsius water bath within 40-60 seconds. The water bath should have clean water containing an antimicrobial agent. As soon as the sample has thawed, remove the cryovial from the water bath. A small ice clump should still remain and the vial should still be cold. From now on, all operations should be carried out under aseptic conditions. Transfer the cryovial to a sterile flow cabinet and wipe with 70% alcohol. Carefully open the vial and transfer the cell suspension into a 15 ml centrifuge tube containing 8 ml of culture medium (room temperature). Resuspend the cells carefully. Centrifuge at 300 x g for 3 min and discard the supernatant. The centrifugation step may be omitted, but in this case the remains of the freeze medium have to be removed 24 hours later. Resuspend the cells carefully in 10 ml fresh cell culture medium and transfer them into two T25 cell culture flasks. All further steps are described in the subculture section.
Handling of proliferating cultures	One or two cell culture flasks come filled with cell culture medium. Collect the entire medium in 1 or 2 x 50 ml centrifuge tubes, respectively. Carefully add 5 ml of cell culture medium to each T25 cell culture flask. Control the cell morphology and confluency under the microscope. Incubate at 37 degree Celsius for a minimum of 24 hours. Spin down the collected medium at 300 x g for 3 minutes to collect the cells which may have detached during transit. If a cell pellet is visible, resuspend the cells in 5 ml of cell culture medium and transfer to a T25 cell culture flask. Incubate at 37 degree Celsius for a minimum of 24 hours.
Sterility	Mycoplasma contaminations are ruled out through PCR-based and luminescence-based mycoplasma assays. The absence of bacterial, fungal or yeast contamination is controlled through daily visual cell monitoring.

Quality control / Genetic profile / HLA

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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