RIN-m5f

305359

GENERAL INFORMATION

Description

RIN-m5F is a clonal rat insulinoma cell line derived from a transplantable islet cell tumor in a rat. It represents a neuroendocrine pancreatic β-cell model and was established as a continuous, clonable line capable of long-term in vitro propagation. The parental RIN line was shown to secrete primarily insulin and somatostatin, with only minimal glucagon production, reflecting a mixed but predominantly β-cell-like endocrine phenotype. RIN-m5F cells grow adherently under standard culture conditions and exhibit high proliferative capacity compared with primary islet cells.

Functional characterization demonstrated that RIN-m5F cells possess specific membrane receptors for insulin, glucagon, and somatostatin, supporting both autocrine and paracrine regulatory mechanisms. Quantitative binding analyses revealed measurable specific binding of all three hormones, with distinct receptor affinities and evidence of receptor downregulation following prolonged hormone exposure. Despite their endocrine origin, RIN-m5F cells are relatively poorly differentiated compared with adult pancreatic islets, secreting low basal levels of insulin and lacking robust glucose-stimulated insulin secretion. This limited glucose responsiveness distinguishes them from mature β-cells and makes them particularly useful for studies of β-cell differentiation and regulatory signaling pathways.

Studies examining surface ganglioside expression have further defined the differentiation status of RIN-m5F cells. Expression of A2B5-reactive gangliosides correlates directly with insulin content, insulin secretion, and insulin mRNA levels in derived sublines, indicating that A2B5 serves as an index of β-cell differentiation. Sublines selected for high A2B5 expression demonstrate markedly increased insulin production, whereas sublines enriched for alternative ganglioside profiles show reduced insulin output. Together, these properties establish RIN-m5F as a versatile in vitro model for investigating pancreatic β-cell biology, hormone receptor signaling, differentiation mechanisms, and islet tumor cell function.

Tissue	Pancreas, islets of Langerhans
Disease	Rat insulinoma

Synonyms

- RIN m5F
- Rin-M-5F
- Rin-m-5F
- RIN-m 5F
- RINm-5F
- RINm5F
- RIN-m clone 5F
- RIN Cl-5F
- RIN-5F
- Rin-5F
- RIN 5F
- RIN5F
- m5F
- 5F

CLASSIFICATION

Organism	Rat
Sex	Male
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Morphology	Epithelial-like
Cell type	Pancreatic beta cell

IDENTIFIERS

Citation

RIN-m5f (Cytion catalog number 305359)

NCBI TaxID	10116
Cellosaurus	CVCL_0501

HANDLING AND CULTURE

Culture medium

RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase
Seeding density	2-4*10^4/cm²
Fluid renewal	2 to 3 times per week

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 recommend 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

Donor age	666 days

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.

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