GIST-T1

305777

GENERAL INFORMATION

Description

The GIST-T1 cell line is a well-established human gastrointestinal stromal tumor (GIST) model derived from a metastatic pleural lesion secondary to a primary gastric GIST in an adult Japanese woman. Immunohistochemical analyses confirmed strong positivity for c-KIT (CD117) and CD34, two hallmark markers of GIST, while the line was negative for desmin, S-100, and α-smooth muscle actin, confirming its non-muscle and non-neural origin. Cytogenetic studies revealed a hypodiploid karyotype with complex chromosomal abnormalities, including a ring chromosome and several unbalanced translocations. Comparative genomic hybridization (CGH) and FISH analyses showed high-level amplifications at 3q26.1-27, 5p12-15.1, and 7q21.3-36-regions often associated with oncogene amplification in GIST.
GIST-T1 harbors a clinically relevant 57-nucleotide in-frame deletion in exon 11 of the *KIT* gene (V570-Y578), one of the most common mutations in GIST patients and a critical target of tyrosine kinase inhibitors such as imatinib. This has made GIST-T1 an essential model for studying KIT-driven oncogenesis and therapeutic response. In long-term culture, GIST-T1 cells show stable proliferation and retain sensitivity to imatinib unless specifically selected for resistance. Derivative resistant sublines of GIST-T1 have been generated for research purposes and exhibit secondary KIT mutations (e.g., D820V or D820Y), enabling the study of resistance mechanisms and adaptive transcriptional changes. These resistant models show alterations in genes related to detoxification, cell cycle regulation, and apoptosis evasion.
GIST-T1 has also contributed to the discovery of novel oncogenic drivers in GIST, including fusion genes such as EXOC2-AK7, identified in imatinib-resistant sublines. Functional studies demonstrated that these fusion genes enhance proliferative and migratory capacities of GIST cells and sensitize them to imatinib, pointing toward new therapeutic avenues. The presence of GIST-associated super-enhancers and transcription factor networks (e.g., HAND1 in metastatic progression) further reinforces the model's utility in deciphering the epigenetic and transcriptional architecture of GIST. Altogether, GIST-T1 provides a robust, genetically and phenotypically validated system for studying the biology, drug response, and resistance mechanisms of gastrointestinal stromal tumors.

Tissue	Metastatic
Disease	Gastrointestinal stromal tumor
Metastatic site	Pleural effusion

Synonyms

- GIST-T-1
- GISTT1
- T1

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Cell type	Interstitial cell of Cajal
Doubling time	48 hours

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IDENTIFIERS

Citation

GIST-T1 (Cytion catalog number 305777)

NCBI TaxID	9606
Cellosaurus	CVCL_4976

EXPRESSION AND SUSCEPTIBILITY

Mutational profile

Mutation: KIT, Simple, p.Val560_Tyr578del (c.1679_1735del), Heterozygous

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	1 to 4 x 10^4 cells/cm^2
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 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.

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	47 years
Ethnicity	Japanese

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.

Disclaimer

Our cells are provided for in vitro laboratory research purposes exclusively and are not intended for clinical or diagnostic use, nor are they to be administered to humans or used for veterinary purposes. Users must adhere to all applicable guidelines and regulations for the handling and use of these cells in a research setting.

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