HT-29-MTX-E12

305801

GENERAL INFORMATION

Description

HT-29-MTX-E12 is a goblet cell-like subclone derived from the human colorectal adenocarcinoma cell line HT29 through selection with methotrexate (MTX), a process that induces differentiation toward mucus-secreting phenotypes. Among several subclones developed from HT29-MTX, the E12 subclone stands out due to its robust formation of confluent monolayers with tight junctions and a significantly thick, continuous mucus layer on the apical surface. This subclone features a higher proportion of mature goblet cells, as demonstrated by Alcian Blue staining, transmission electron microscopy (TEM), and expression of mucin genes MUC1 and MUC2. In fact, MUC1 and MUC2 mRNA levels were substantially higher in HT-29-MTX-E12 compared to other subclones and parent HT29 cells, correlating with a mucus thickness of approximately 142 ± 51 µm-comparable to the in vivo intestinal environment.
Functionally, HT-29-MTX-E12 has been shown to model the barrier properties of the human intestinal mucus layer, particularly in evaluating the absorption of lipophilic drugs. The presence of a thick mucus barrier significantly reduces the apparent permeability coefficients (Papp) of lipophilic compounds such as testosterone and various barbiturates when compared to mucus-free Caco-2 cells. For example, testosterone showed a 43% reduction in Papp in HT-29-MTX-E12, highlighting the impact of mucus on drug diffusion. Despite having a leakier epithelial barrier than Caco-2 cells, HT-29-MTX-E12 maintains physiological relevance through its mucus-producing capacity, making it a valuable in vitro model for investigating intestinal drug absorption and the influence of mucus on permeability.

Tissue	Colon
Disease	Colon adenocarcinoma

Synonyms

- HT29-MTX-E12
- MTX-E12

CLASSIFICATION

Organism	Human
Sex	Female
Growth properties	Adherent
Biosafety level	1

CHARACTERISTICS

Cell type	Epithelial

IDENTIFIERS

Citation

HT-29-MTX-E12 (Cytion catalog number 305801)

NCBI TaxID	9606
Cellosaurus	CVCL_G356

Cytion GmbH
Nikola-Tesla-Str. 3
69124 Heidelberg
Tel: +49 (0)6221 405780
info@cytion.com
cytion.com

Registered office Heidelberg
VAT ID: DE283292917
Local court Mannheim - HRB 714394
CEO / Geschäftsführer: Jonathan Steubing

Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB

EXPRESSION AND SUSCEPTIBILITY

Mutational profile

Mutation: APC, Simple, p.Glu853Ter (c.2557G>T), Heterozygous (from parent cell line).Mutation, APC, Simple, p.Thr1556Asnfs*3 (c.4666dupA) (c.4666_4667insA), Heterozygous (from parent cell line).Mutation, BRAF, Simple, p.Val600Glu (c.1799T>A), Heterozygous (from parent cell line).Mutation, PIK3CA, Simple, p.Pro449Thr (c.1345C>A), Heterozygous (from parent cell line).Mutation, SMAD4, Simple, p.Gln311Ter (c.931C>T), Homozygous (from parent cell line).Mutation, TP53, Simple, p.Arg273His (c.818G>A), Homozygous (from parent cell line).

HANDLING AND CULTURE

Culture medium

EMEM (MEM Eagle), w: 2 mM L-Glutamine, w: 2.2 g/L NaHCO3, w: EBSS (Cytion article number 820100a)

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

Supplements

Supplement the medium with 10% FBS and 1% NEAA

Dissociation reagent	Accutase

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	44 years
Ethnicity	Caucasian

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

Cytion GmbH
Nikola-Tesla-Str. 3
69124 Heidelberg
Tel: +49 (0)6221 405780
info@cytion.com
cytion.com

Registered office Heidelberg
VAT ID: DE283292917
Local court Mannheim - HRB 714394
CEO / Geschäftsführer: Jonathan Steubing

Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB