Product sheet

IEC-18 Cells | 305302

General information

Description	The IEC-18 cell line is a non-transformed epithelial cell line derived from the crypt cells of rat small intestine. These cells have been shown to effectively model the physiological properties of the small intestinal epithelium, particularly with respect to chloride ion (Cl^-) transport. Chloride channels in IEC-18 cells exhibit distinct types of conductances that respond to various stimuli such as cell swelling, increased intracellular calcium (Ca^{2+}), and elevated cyclic AMP (cAMP). For instance, swelling-activated Cl^- currents in IEC-18 cells are characterized by outward rectification and voltage independence. Moreover, IEC-18 cells express cystic fibrosis transmembrane conductance regulator (CFTR) channels, evidenced by the presence of cAMP-activated Cl^- conductance which can be inhibited by glibenclamide and 5-nitro-2-(3-phenylpropylamino) benzoic acid (NPPB), but not affected by DIDS. IEC-18 cells have also been used to explore cell survival mechanisms under detachment-induced stress, known as anoikis. Research indicates that prostaglandin E2 (PGE2) can promote cell viability and aggregation in detached IEC-18 cells through cAMP-mediated signaling pathways. This protection from anoikis is associated with the activation of adenylate cyclase and protein kinase A (PKA), enhancing cell adhesion and viability even in suspended states. Such findings are significant for understanding inflammation-related processes and potential contributions to carcinogenesis in intestinal tissues. Furthermore, IEC-18 monolayers have been employed to study the transport of various molecules across the intestinal barrier. Compared to the Caco-2 cell line, IEC-18 cells provide a more accurate model for passive transcellular and paracellular transport due to their structural similarities to small intestine crypt cells. Unlike Caco-2 cells, which possess significant active transport capabilities, IEC-18 cells demonstrate minimal carrier-mediated transport, making them a more suitable choice for analyzing the passive permeability of hydrophilic macromolecules.
Organism	Rat
Tissue	Small intestine, ileum
Disease	Normal
Synonyms	IEC 18, IEC18, Intestinal Epithelioid Cell line No. 18

Characteristics

Breed/Subspecies	Charles River Sprague Dawley (CD(SD))
Age	18-24 days
Gender	Unspecified
Morphology	Epithelial-like

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Cell type	Epithelial cell
Growth properties	Adherent

Regulatory Data

Citation	IEC-18 (Cytion catalog number 305302)
Biosafety level	1
NCBI_TaxID	10116
CellosaurusAccession	CVCL_0342

Biomolecular Data

Handling

Culture Medium	DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)
Supplements	Supplement the medium with 10% FBS
Dissociation Reagent	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.
Seeding density	2×10^4 cells/cm^2
Fluid renewal	2 times per week
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.

Thawing and Culturing Cells	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. 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.
Incubation Atmosphere	37°C, 5% CO_2, humidified atmosphere.
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.
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.

Quality Control & Molecular Analysis

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.