

786-O Cells | 300107**General information****Description**

786-O cells are a human renal cell carcinoma cell line derived from a primary clear cell adenocarcinoma of the kidney. This cell line is frequently used in the study of renal cell carcinoma (RCC), providing valuable insights into the biological characteristics and treatment responses of this cancer type.

The 786-O cell line exhibits a clear cell morphology, typical of the most common form of kidney cancer, and is characterized by specific genetic alterations, including the loss of the von Hippel-Lindau (VHL) tumor suppressor gene. This genetic feature is significant as it plays a crucial role in the pathogenesis of many clear cell renal carcinomas by influencing hypoxia-inducible pathways, which are central to cellular responses to low oxygen conditions.

These cells are particularly useful for studying the molecular mechanisms involved in tumor growth and survival, including pathways related to angiogenesis, metabolism, and cell cycle regulation. Due to their VHL deficiency, 786-O cells are an excellent model for researching the effects of hypoxia and for testing drugs that target hypoxia-related pathways.

In addition to their application in basic cancer research, 786-O cells are also used in preclinical studies to evaluate the efficacy of new therapeutic agents, especially those targeting the angiogenic processes driven by the overexpression of hypoxia-inducible factors (HIFs). This includes therapies that inhibit the HIF pathway, tyrosine kinase inhibitors, and immune checkpoint inhibitors.

Overall, 786-O cells provide a robust model for advancing our understanding of the molecular underpinnings of renal cell carcinoma and for developing targeted therapies that could improve treatment outcomes for patients with this challenging disease.

Organism

Human

Tissue

Kidney

Disease

Renal cell carcinoma

Applications

This cell line is an optimal choice for transfection.

Synonyms

786-o, 786O, 786-0, 786.O, 786-O RCC, RCC 786-O, RCC_786O, RCC 786O, 786O, 786-0WT

Characteristics**Age**

58 years

Gender

Male

Ethnicity

Caucasian

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Morphology Epithelial-like

Growth properties Monolayer, adherent

Identifiers / Biosafety / Citation

Citation 786-O (Cytion catalog number 300107)

Biosafety level 1

Expression / Mutation

Antigen expression CAIx +, as confirmed by FACS analysis.

Tumorigenic In immunosuppressed hamsters

Products The cells produce a PTH (parathyroid hormone) like peptide that is identical to peptides produced by breast and lung tumors. It has an N terminal sequence similar to PTH, has PTH like activity, and has a molecular weight of 6000 daltons.

Ploidy status Hypertriploid. Y chromosome was observed in 60% of the cells analyzed.

Karyotype Hypertriploid. Y was present in 60% of cells examined

Handling

Culture Medium RPMI 1640, w: 2.1 mM stable Glutamine, w: 2.0 g/L NaHCO₃ (Cytion article number 820700a)

Medium supplements Supplement the medium with 10% FBS

Passaging solution Accutase

Doubling time 24 hours

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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.
Split ratio	A ratio of 1:4 to 1:12 is recommended
Seeding density	1×10^4 cells/cm ² will result in a confluent monolayer within 4 days.
Fluid renewal	2 to 3 times per week
Freezing recovery	After thawing, plate the cells at 4×10^4 cells/cm ² and allow the cells to recover from the freezing process and to adhere for at least 48 hours.
Freeze medium	CM-1 (Cytion catalog number 800100) or CM-ACF (Cytion catalog number 806100)

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Handling of cryopreserved cultures

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. Optionally, skip centrifugation but remove any remaining freezing medium after 24 hours.
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.

Quality control / Genetic profile / HLA

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.

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STR profile

Amelogenin: x,y
CSF1PO: 10
D13S317: 8
D16S539: 12
D5S818: 9
D7S820: 11,12
TH01: 6,9.3
TPOX: 8,11
vWA: 15,17
D3S1358: 16
D18S51: 13,14
Penta E: 7,16
Penta D: 9,12
D8S1179: 13
FGA: 24,25

HLA alleles

A*: 03:01:01
B*: 07:02:01, 44:02:01
C*: 05:01:01, 07:02:01
DRB1*: 13:01:01, 15:01:01G
DQA1*: 01:02:01, 01:03:01
DQB1*: 06:02:01, 06:03:01
DPB1*: 04:02:01, 105:01:01
E: 01:01:01, 01:03