Product sheet

Caki-2 Cells | 300140

General information

Description	Caki-2 is a human clear cell renal cell carcinoma (ccRCC) cell line that exhibits epithelial morphology and adheres during in vitro culture conditions. It serves as an essential preclinical model for the investigation of renal cancer mechanisms and therapeutic responses. The Caki-2 line is particularly notable for its resistance to certain chemotherapeutic agents; it displays decreased sensitivity to 5-fluorouracil and the multi-kinase inhibitor sorafenib, which targets VEGFRs 1-3, PDGFR-b, and Raf-1, in comparison to the Caki-1 cell line. This differential sensitivity is significant for studying drug resistance mechanisms and evaluating new therapeutic strategies in renal cell carcinoma. The genetic background of Caki-2 cells includes a loss-of-function mutation in the von Hippel-Lindau (VHL) tumor suppressor protein, a hallmark of many ccRCCs that leads to the deregulation of hypoxia-inducible factors (HIFs) and contributes to tumorigenesis. The ability of Caki-2 cells to form tumors in immunocompromised mice makes them a valuable tool for in vivo studies of cancer growth and metastasis, providing insights into the tumor environment and potential therapeutic interventions. Their use extends to exploring the role of VHL in cancer progression and testing the efficacy of drugs targeting the HIF pathway and other associated signaling cascades in a controlled experimental setup.
Organism	Human
Tissue	Kidney
Disease	Papillary carcinoma
Synonyms	CAKI-2, CaKi-2, caki-2, CAKI 2, Caki 2, Caki2, CAKI2

Characteristics

Age	69 years
Gender	Male
Ethnicity	Caucasian
Morphology	Epithelial-like. Ultrastructural features include microvilli and microfilaments. Few mitochondria, lysosomes or lipid droplets. Frequent multilamellar bodies. No virus particles.
Growth properties	Monolayer, adherent

Regulatory Data

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Citation	Caki-2 (Cytion catalog number 300140)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_0235

Biomolecular Data

Isoenzymes	Me-2, 1, PGM3, 1, PGM1, 1, ES-D, 1, AK-1, 1, GLO-1, 1-2, G6PD, B, Phenotype Frequency Product: 0.0511
Tumorigenic	Yes, in nude mice. Forms clear cell carcinoma
Karyotype	(P8) hypopentaploid to hypohexaploid (+A2, +A3, +B, +C, +D, +F, +G, -A) with abnormalities including dicentrics, acrocentric fragments, minutes, breaks, and large subtelocentric markers

Handling

Culture Medium	RPMI 1640, w: 2.0 mM stable Glutamine, w: 2.0 g/L NaHCO3 (Cytion article number 820700a)
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	1 x 10^4 cells/cm^2 will result in a 90% confluent monolayer in about 4 days
Fluid renewal	2 to 3 times per week
Post-Thaw Recovery	After thawing, plate the cells at 5 x 10^4 cells/cm^2 and allow the cells to recover from the freezing process and to adhere for at least 24 hours.

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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.
Flask Coating	None
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.