Product sheet

VCaP Cells | 300631

General information

Description	The VCaP (Vertebral-Cancer of the Prostate) cell line is an important model in the study of prostate cancer, derived from a vertebral metastasis of a human prostate carcinoma. It was established to provide a relevant in vitro model for researching the biology of prostate cancer and its metastatic process, particularly focusing on hormone-refractory stages of the disease. VCaP cells are known for expressing a high level of prostate-specific antigen (PSA) and androgen receptor (AR), making them highly relevant for studies on androgen receptor signaling pathways and resistance mechanisms to anti-androgen therapy. VCaP cells are also utilized extensively in genetic studies, as they harbor the TMPRSS2-ERG gene fusion, a common chromosomal translocation found in approximately 50% of prostate cancer cases. This specific genetic alteration is significant because it is thought to play a crucial role in the progression of prostate cancer. The cells are thus an excellent tool for research aiming to understand the molecular underpinnings of prostate cancer and for the development of new therapeutic strategies targeting TMPRSS2-ERG and related pathways. Moreover, VCaP cells exhibit robust in vitro growth and can form tumors when xenografted in immunodeficient mice, providing a useful system for preclinical studies of new anticancer drugs. Overall, the VCaP cell line serves as a vital resource for molecular and pharmacological studies, contributing significantly to the understanding of prostate cancer biology and the assessment of new therapeutic agents. Its characteristics, including hormone responsiveness, gene fusion expression, and metastatic origin, make it uniquely suitable for advanced prostate cancer research, particularly in areas related to androgen independence and metastatic disease progression.
Organism	Human
Tissue	Prostate
Disease	Prostate carcinoma
Metastatic site	Bone, vertebra
Synonyms	VCAP, Vcap, Vertebral Cancer of the Prostate

Characteristics

Age	59 years
Gender	Male
Ethnicity	European
Growth properties	Adherent

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Regulatory Data

Citation	VCaP (Cytion catalog number 300631)
Biosafety level	VCaP cells are classified as Biosafety Level 1 (BSL-1) for standard lab work. However, for genetic engineering, the ZKBS classifies them as Biosafety Level 2 (BSL-2).
NCBI_TaxID	9606
CellosaurusAccession	CVCL_2235

Biomolecular Data

Antigen expression	P53 antigen, Cytokeratin-18, prostate-specific antigen, prostatic acid phosphatase, Rb protein
Tumorigenic	Yes, in SCID mice
Viruses	Mouse xenotropic retrovirus Bxv-1

Handling

Culture Medium	DMEM:Ham's F12 (1:1), w: 3.1 g/L Glucose, w: 2.5 mM L-Glutamine, w: 15 mM HEPES, w: 0.5 mM Sodium pyruvate, w: 1.2 g/L NaHCO3 (Cytion article number 820400a)
Supplements	Supplement the medium with 10% FBS
Dissociation Reagent	Accutase
Doubling time	Slow growing cell line, doubling time 5-6 days.
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	4-8 x 10^4 cells/cm^2

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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.
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.