Product sheet

LS513 Cells | 300457

General information

Description	The LS513 cell line is a well-characterized colorectal carcinoma model derived from a primary tumor biopsy taken in 1985 from a 63-year-old Caucasian male patient. The tumor was classified as a Dukes' C mucin-secreting cecal carcinoma located at the Bauhin valve. LS513 cells are adherent in nature and have demonstrated multidrug resistance (MDR), making them a valuable model for studying drug resistance mechanisms in colorectal cancer. These cells exhibit a 30% colony-forming efficiency in methylcellulose and are tumorigenic in nude mice, further validating their use in oncogenic studies. At the genetic level, LS513 cells express several notable features. They are positive for the p53 wild-type oncogene and express carcinoembryonic antigen (CEA) on approximately 50% of the cells. Additionally, LS513 cells express major histocompatibility complex (MHC) class I antigens, including HLA and beta 2 microglobulin, but lack MHC class II antigens (HLA-DR, DQ, and DP). The cells also produce transforming growth factor beta 1 (TGF beta-1) at a rate of 83 pg per 10^6 cells per 24 hours. Notably, TGF beta-1 acts as an inhibitor of LS513 cell proliferation, whereas TGF beta-2 has no significant effect on their growth. Compared to the LS1034 cell line, LS513 cells are 100-fold less sensitive to TGF beta-1, indicating distinct responses to growth factor signaling between these two colorectal carcinoma models. LS513 cells exhibit a unique profile of antigen expression, with strong positivity for intercellular adhesion molecule 1 (ICAM-1) and HLA class I antigens. The lack of MHC class II antigen expression is particularly noteworthy, as it suggests potential immune evasion mechanisms that could be relevant to colorectal cancer progression and metastasis. These features, along with their resistance to multiple drugs and their ability to form tumors in immunocompromised mice, make LS513 cells a powerful tool for studying the molecular and cellular underpinnings of colorectal cancer, especially in the context of immune interactions and therapeutic resistance.
Organism	Human
Tissue	Colorectal
Disease	Adenocarcinoma
Synonyms	LS513, LS 513

Characteristics

Age	63 years
Gender	Male
Ethnicity	Caucasian
Morphology	Epithelial-like

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Growth properties	Adherent

Regulatory Data

Citation	LS513 (Cytion catalog number 300457)
Biosafety level	1
NCBI_TaxID	9606
CellosaurusAccession	CVCL_1386

Biomolecular Data

Protein expression	CEA+ (50%), p53+
Antigen expression	Carcinoembryonic antigen (CEA), ICAM-1, HLA class I positive
Tumorigenic	Yes, forms tumors in nude mice
Products	Transforming growth factor beta 1 (TGF beta-1, 83 pg per 10 exp6 cells per 24 hours)
Karyotype	Two stem lines can be distinguished. The main one was represented in 65% of the cells, with a modal number of 51,xY and 3 markers, M1 - der(1)t(1,15), M2 - der(2)t(2,3)der(3)t(2,3), M3, and a monosomy 15. The second stem line had a modal chromosome number of 52,xY and presented M2 and M3 plus an isochromosome for the long arm of chromosome 1 called M4. A trisomy 5,7, a tetrasomy 13, and a monosomy 2 and 3 were present in all of the cells analyzed, the line did not exhibit monosomy 15.

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

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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.
Seeding density	1 x 10^4 cells/cm^2
Fluid renewal	Every 3 days
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.
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.