SRA01-04

305436

GENERAL INFORMATION

Description

The SRA01/04 cell line is an immortalized human lens epithelial cell line developed to overcome the limitations associated with primary cultures of human lens epithelial (HLE) cells. These limitations include their low proliferative capacity and the difficulty of obtaining sufficient quantities of cells from donor lenses. SRA01/04 was derived from primary HLE cells obtained from infants undergoing surgery for retinopathy of prematurity. The immortalization was achieved by transfection with a plasmid carrying the SV40 large T antigen gene under the control of the RSV promoter. This approach avoids the use of live virus and permits selection of a uniform clone with consistent characteristics. SRA01/04 cells exhibit stable proliferation over 130 passages with a population doubling level of approximately 3.5 per passage. Morphologically, they maintain a monolayer with epithelial characteristics. Chromosomal analysis revealed a hypotetraploid karyotype, consistent with an immortalized status. The isozyme phenotype confirmed their human origin. Importantly, the cell line retains lens-specific molecular features, including the expression of αA- and βB-crystallins and aldose reductase, though at lower protein levels than seen in primary HLE cultures. mRNA for both crystallins was also detected via RT-PCR, and sequencing confirmed 100% identity with published human sequences. This makes SRA01/04 the first established human lens cell line shown to express both αA- and βB-crystallins.
In addition to crystallin expression, SRA01/04 expresses aldose reductase, an enzyme involved in the polyol pathway, which is relevant to cataractogenesis. While optimal growth requires 20% fetal bovine serum, the cells can survive and proliferate with reduced serum levels or even in serum-free conditions if pre-attached to culture dishes. This adaptability, along with their stable lens-specific phenotype, renders SRA01/04 a valuable model for studying lens physiology, gene regulation in the lens epithelium, and mechanisms underlying cataract formation.

Tissue	Eye, ocular lens, epithelium

Synonyms

- SRA 01-04
- HLEC-SRA 01-04
- HLE-SRA-01-04
- SRA01-04 (HLE)
- SRA 01/04
- HLEC-SRA 01/04
- HLE-SRA-01/04
- SRA01/04 (HLE)

CLASSIFICATION

Organism	Human
Sex	Male
Growth properties	Adherent
GMO status	GMO-S1

GMO status details

GMO-S1: This SRA01-04 human lens epithelial line contains an SV40 large T-antigen construct enabling ocular lens research. This classification applies only within Germany and may differ elsewhere.

Biosafety level	1

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Banking information
Sparkasse Heidelberg
IBAN: DE35 6725 0020 0009 2076 86
BIC: SOLADES1HDB

CHARACTERISTICS

Morphology	Epithelial-like
Cell type	Ocular lense

IDENTIFIERS

Citation

SRA01-04 (Cytion catalog number 305436)

NCBI TaxID	9606
Cellosaurus	CVCL_7157

EXPRESSION AND SUSCEPTIBILITY

Protein expression

Genetic integration: Method=Transfection; Gene=UniProtKB; P03070; SV40 large T antigen

Isoenzymes

LD, NP

HANDLING AND CULTURE

Culture medium

DMEM low glucose

Incubation atmosphere	37°C, 5% CO_2, humidified atmosphere.

Supplements

Supplement the medium with 10% FBS

Dissociation reagent	Accutase
Seeding density	2-4*10^4/cm²
Fluid renewal	2 times per week

Thawing and culturing

Confirm that the vial remains deeply frozen upon delivery, as cells are shipped on dry ice to maintain optimal temperatures during transit. 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.
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.
Perform all subsequent steps under sterile conditions in a flow hood, disinfecting the cryovial with 70% ethanol before opening.
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.
Centrifuge the mixture at 300 x g for 3 minutes to separate the cells and carefully discard the supernatant containing residual freezing medium.
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.
Adhere to established subculture protocols for continued growth and maintenance of the cell line, ensuring reliable experimental outcomes.

QUALITY CONTROL AND CRYOPRESERVATION

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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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.

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.

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.

DONOR

Donor age	3 months

LEGAL AND SAFETY

Safety precautions

When planning to store a cryovial in liquid nitrogen for future thawing, it is mandatory to adhere to stringent safety measures. Appropriate protective gloves and clothing are essential, and the use of a face mask or safety goggles is required during the transfer of frozen samples to or from the liquid nitrogen tank. This is to mitigate the risk of injury from potential cryovial explosions upon removal, which can result in the projection of sharp fragments.

Warranty

At Cytion, we stand behind the quality and viability of our products.
We guarantee that our cells will be viable at the start of culture for
60 days after shipment from our facilities.
We assure that all materials conform to the specifications described in the
Certificate of Analysis and/or Product Sheet.
For full details, please refer to our
Warranty Statement.

Material Transfer Agreement required	Yes

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