# 661W

305889

## GENERAL INFORMATION

### Description

661W is a murine cone photoreceptor-derived cell line originally established from a retinal tumor arising in a transgenic mouse expressing simian virus 40 (SV40) large T antigen under control of the human interphotoreceptor retinoid-binding protein (IRBP) promoter. The line was generated from postnatal retinal explants and represents immortalized cone photoreceptor precursors. 661W cells exhibit adherent growth and are routinely maintained in Dulbecco's modified Eagle medium supplemented with fetal bovine serum under standard culture conditions. They have been widely used as an in vitro model of cone photoreceptors, particularly in studies of light-induced damage, oxidative stress, apoptosis, and retinal degenerative mechanisms.
Molecular and transcriptomic characterization confirms that 661W cells express the majority of cone photoreceptor markers, including cone opsins and phototransduction-associated genes. High-resolution imaging studies demonstrate that these cells form primary cilia with structural features reminiscent of photoreceptor connecting cilia and outer segments. Immunocytochemical and ultrastructural analyses reveal localization of ciliary proteins to the axoneme, membrane, and transition zone, supporting their utility in investigating retinal ciliopathies. Functional studies have shown that siRNA-mediated knockdown of intraflagellar transport genes such as Ift88 leads to loss of cilia, validating 661W as a tractable system for mechanistic studies of ciliary biology.
661W cells are highly sensitive to photooxidative stress. Exposure to visible light induces apoptotic cell death associated with downregulation of NF-κB activity and activation of caspase pathways. Overexpression of anti-apoptotic proteins such as Bcl-2 confers resistance to light-induced apoptosis, maintaining NF-κB nuclear activity and improving cell survival. These properties make 661W a robust model for dissecting molecular pathways underlying photoreceptor degeneration. It is important to note that the 661W line has also been implicated in historical cell line misidentification events, including cross-contamination with the RGC-5 line, underscoring the necessity of rigorous authentication when employing this model. Collectively, 661W provides a well-characterized murine cone photoreceptor platform for studying retinal degeneration, oxidative stress responses, ciliary function, and therapeutic interventions targeting cone survival.

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| **Tissue** | Eye, retina |
| **Metastatic site** | Primary tumor site (retina) |

### Applications

Cone photoreceptor biology; light-induced retinal degeneration; oxidative stress apoptosis; photoreceptor ciliary biology; retinal degenerative disease modeling; NF-κB and caspase pathway studies; ophthalmic drug evaluation

### Synonyms

- 661w
- 661 W

## CLASSIFICATION

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|---|---|
| **Organism** | Mouse |
| **Sex** | Male |
| **Growth properties** | Adherent |
| **GMO status** | GMO-S1 |

### GMO status details

GMO-S1: The 661W line was derived from a transgenic mouse expressing SV40 large T antigen under the IRBP promoter; this transgene drives photoreceptor-specific immortalization. This classification applies only within Germany and may differ elsewhere.

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| **Biosafety level** | 1 |

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## CHARACTERISTICS

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| **Morphology** | Cone photoreceptor-like |
| **Cell type** | Retinal cone cells |
| **Doubling time** | ~24 hours |

## IDENTIFIERS

**Citation**

661W (Cytion catalog number 305889)

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| **NCBI TaxID** | 10090 |
| **Cellosaurus** | CVCL_6240 |

## HANDLING AND CULTURE

**Culture medium**

DMEM, w: 4.5 g/L Glucose, w: 4 mM L-Glutamine, w: 3.7 g/L NaHCO3, w: 1.0 mM Sodium pyruvate (Cytion article number 820300a)

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| **Incubation atmosphere** | 37°C, 5% $CO_2$, humidified atmosphere. |

**Supplements**

Supplement the medium with 10% FBS

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| **Dissociation reagent** | Accutase |
| **Split ratio** | 1 to 5 |
| **Seeding density** | 1 to 3 × $10^4$ cells/$cm^2$ |
| **Fluid renewal** | Every 2 to 3 days |

**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 200 x g for 5 minutes, carefully discard the supernatant containing freezing medium.
Follow the procedure described under Post-Thaw Recovery

## QUALITY CONTROL AND CRYOPRESERVATION

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| **Freeze medium** | As a cryopreservation medium, we use complete growth medium + 10% DMSO for adequate post-thaw viability. |

**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

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| **Donor age** | Age unspecified |

## 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.

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| **Material Transfer Agreement required** | Yes |