

User Manual

OriCell™ Astrocyte Differentiation Medium For Rat Neural Stem Cells

Catalog No. RAXNX-90091



Introduction

Astrocytes (also known as astroglial cells) are star-shaped glial cells found in the brain and spinal cord. They perform essential biological functions such as participating in the formation of the blood-brain barrier, providing nutrients to neural tissue, maintaining extracellular ion balance, and have potential applications in the treatment of brain injuries and spinal cord damage.

Astrocytes are widely used in neurobiological research, including maintaining the extracellular environment of the central nervous system, supporting neuronal metabolism and neurotransmitter synthesis, and contributing to the development of new drugs for Parkinson's disease and Alzheimer's disease.

OriCell™ Astrocyte Differentiation Medium For Rat Neural Stem Cells contains a basal medium and additives designed to induce neural stem cells to differentiate into astrocytes. This kit effectively induces the differentiation of rat neural stem cells into astrocytes.

Note: This product is only provided for further scientific research. It is not intended for diagnostic, therapeutic, clinical, household, or any other applications.

When citing our products in academic journals, please indicate "OriCell™ + Catalog Number, from Cyagen Biosciences (Guangzhou) Inc."

Product Information

| Components | Catalog Number | Volume |
|--|----------------|--------|
| OriCell™ Basal Medium For Cell Culture | BNRO-03011 | 94 mL |
| OriCell™ Supplements For Rat NSC Astrocyte Differentiation | RAXNX-04091 | 6 mL |

QC

- Pass the detection of bacteria, fungi, mycoplasma, and endotoxins.
- Pass the detection of osmotic pressure and pH.
- Pass the detection of product quality.

Please refer to "COA" for details.

General Handling Principles

1. Ensure that all equipment is kept clean and tidy.
2. Standard operation method. Please operate according to the method described in the product manual, strictly control the variables, and do a controlled experiment.
3. The ingredients should be properly stored in accordance with the storage conditions and used as soon as possible.
4. If a complete set of medium cannot be used in a short period of time, it should be prepared in batches according to the volume ratio of each component in the kit and stored in aliquots.

Product Stability and Storage Conditions

1. All ingredients must be kept in dark place.
2. The basal medium should be stored in a refrigerator at 4 °C for a period of 1 year. Other components should be stored at -20°C for a period of 2 years.
3. The prepared complete medium can be stored at 4 °C for a period of 1 month. If the culture conditions are stable, the container has great sealing performance, and there is no alternation of hot and cold condition, the period of using can be appropriately extended, but not exceed 45 days.
4. Please use all products within the expiration date. Expired ingredients may significantly affect the cell culture effect.

Preparation of Complete Medium

Materials Required

- OriCell™ Astrocyte Differentiation Medium For Rat Neural Stem Cells (Cat. No.: RAXNX-90091)
- Clean, sterile, and stable quality disposable consumables (pipettes, pipette tips, centrifuge tubes, etc)
- Clean sealing film
- Aluminum foil paper and other light-avoiding materials

Steps

Preparation of Rat Neural Stem Cell to Neuron Induction Differentiation Medium

1. At least 30 minutes before preparation, place the OriCell™ Supplements For Rat NSC Astrocyte Differentiation (Cat. No.: RAXNX-04091) at room temperature to allow it to thaw completely.
2. Invert or gently flick the reagent tube to mix the reagent.

- Carefully wipe the outer packaging of all ingredients with 75% ethanol. Open the package inside a clean bench area.
- Add all of the supplement (Cat. No.: RAXNX-04091) to OriCell™ Basal Medium For Cell Culture (Cat. No.: BNRO-03011).
- Tighten the cap of the basal medium bottle, shake gently and thoroughly.

Note: If the medium will not be used up immediately, we recommend preparing in batches. Please prepare the required amount according to the ratio of each component in the kit. Any remaining components must be stored according to their respective storage conditions and should not be subjected to multiple freeze-thaw cycles.

- Seal the bottle opening with parafilm, wrap the bottle in aluminum foil, and label it with the product name, preparation date, and other relevant information.

Note: All components in OriCell™ Astrocyte Differentiation Medium For Rat Neural Stem Cells are strictly aseptically controlled. Under normal circumstances, we do not recommend sterilization again. If there is a risk of contamination during the preparation process, the complete medium can be filtered and sterilized.

Procedure for Inducing Differentiation

Materials Required

- OriCell™ Astrocyte Differentiation Medium For Rat Neural Stem Cells (Cat. No.: RAXNX-90091)
- OriCell™ Phosphate-Buffered Saline Solution (1X) (Cat. No.: PBS-10001)
- Poly-L-lysine (PLL)
- Laminin
- Sterile Ultrapure Water

Steps

Coat the Surface of the Culture Vessel with Poly-L-lysine (PLL) and Laminin

1. Prepare the PLL/Laminin coating at least one day before the cell differentiation experiment.
2. Dilute Poly-L-lysine (PLL) with sterile ultrapure water to a final concentration of 15 µg/mL and set aside.
3. Add an appropriate amount of the PLL solution from step 2 to the culture plate, gently shake to evenly cover the bottom surface.
4. Incubate at room temperature for 30 minutes.
5. Aspirate the PLL solution and wash once with an appropriate amount of sterile water.
6. Dilute Laminin with sterile ultrapure water to a final concentration of 15 µg/mL and set aside.
7. Add the Laminin solution from step 6 to the culture plate, gently shake to evenly cover the bottom surface, seal with sealing film, and incubate overnight at 4°C for later use.

Note: The coated culture plates can be stored at 4°C for up to one week under sterile conditions without allowing the Laminin to dry out. Please use within one week.

8. After the dyed 6-well plate is encapsulated with parafilm, it can be stored at 4°C for 2 weeks.

Protocol for Culturing Rat Neural Stem Cells (NSCs)

1. Prewarm the complete medium to 37°C.
2. Prepare a 15 mL or other suitable centrifuge tube and collect the medium from the culture vessel.
3. Wash the cells once with the basal medium (if available), handling gently and thoroughly, then collect the basal medium.
4. Centrifuge all collected cell suspensions at 160 × g for 5 minutes.
5. After centrifugation, remove the supernatant. Add 1 mL of complete medium and gently pipette the cell pellet about 15–20 times to fully resuspend and mix the cells.

Note: Pipetting should be gentle to avoid generating excessive bubbles, which may cause cell damage and loss

6. Seed the cells at a density of $(2.5-4) \times 10^4$ viable cells/cm² into appropriate culture vessels.

Note: Neural stem cell culture requires a relatively high accuracy in cell density. We recommend manual cell counting when conditions permit and counting efficiency is high, in order to obtain precise cell concentration for seeding guidance. In the absence of accurate counting capabilities, passaging at an appropriate ratio is a better approach. Typically, neural stem cells are passaged at a ratio of 1:2 to 1:3 and reach a confluency suitable for passaging within 72 hours. Please adjust the passaging ratio according to the actual growth status of the cells.

7. Gently mix the cells and place them in a 37°C, 5% CO₂, saturated humidity incubator.
8. On the day after passaging, observe the cell condition and add fresh medium as needed.

Note: If you observe a significant amount of cell death after passaging, perform a medium change (Please refer to passaging steps 2–4: after centrifugation, remove the supernatant, gently resuspend the pellet a few times in 1 mL of complete medium, and then seed the cells. Avoid repeated pipetting).

Standard Operating Procedure for Induced Differentiation of Astrocytes

1. Seed mouse neural stem cells at a density of $(1-2) \times 10^5$ cells per well into six-well plates pre-coated with PLL/Laminin. Add 2 mL of OriCell™ Astrocyte Differentiation Medium For Rat Neural Stem Cells (Cat. No.: RAXNX-90091) to each well.
2. Gently mix the cells and place the plates in a 37°C, 5% CO₂, humidified incubator
3. Thereafter, replace the induction differentiation medium with fresh medium every 3 days.
4. Perform relevant analyses or extract RNA/protein for downstream experiments on day 7.

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