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Working

Neural rosette banking

In 1 collection

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Neurodegeneration Method Development Community

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PDF

IPSC CORTICAL DIFFERENTIATION 022017.pdf

PROTOCOL STATUS

Working

We use this protocol in our group and it is working

GUIDELINES

This protocol is part of the IPSC CORTICAL DIFFERENTIATION collection.

This method should be performed using sterile technique.

MATERIALS TEXT

Please refer to the attached full manuscipt for requried materials.

SAFETY WARNINGS

Please refer to the SDS (Safety Data Sheet) for information about hazards, and to obtain advice on safety precautions.

1 Make 2x stock of serum-free neural freezing medium by adding **10 ml** of sterile DMSO to **40 ml** of sterile KOSR into a 50 ml conical tube. Mix by inverting 3-4 times. Store at **4 °C** for up to 4 weeks.

2 Aspirate supernatant from 15mL conical tube containing 1 well of neural rosette clusters. See protocol below.

PROTOCOL

Neural Rosette Formation and Selection
by Celeste Karch,
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PREVIEW RUN

2.1 On Day 5 of neural aggregate formation, remove media (by pipetting) and carefully wash spheres with **100 µl** of pre-warmed DMEM/F12. Repeat 2 times.

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Do not break apart spheres. Neural spheres are very delicate at this stage. An alternative approach is to remove 50 µl of spent media and wash with 50 µl **DMEM/F12** . Add 50 µl **fresh neural induction media** . Transfer 100 µl of spheres and media to the new PLO/laminin-coated well. This approach will transfer more dead cells into the new well.

2.2 Remove the last wash and add 50 µl of neural induction media to each well.

2.3 Aspirate laminin from one well of the pre-coated plate. Using 200 µl sterile tips, carefully pipet up spheres from wells using 100 µl volume and transfer thirty-two spheres per well. Repeat above steps for the remaining wells. Incubate cells in 37 °C , 5% CO_2 and 95% humidified chamber and distribute evenly by making a “T” motion.

2.4 After 24:00:00 , examine attached aggregates. Remove medium and replace with 2mls/well fresh neural induction medium daily.

If some aggregates have not attached, carefully pipet out all medium and replace with 1ml/well fresh neural induction medium. Once 90-100% of aggregates attach, exchange medium daily with 2mls/well neural induction medium.

2.5 Monitor spheres daily under microscope for formation of neural rosette structures. Neural rosettes are ready to harvest when spheres have completely flattened and clusters are clearly visible (3-7 days after plating, line dependent).

2.6 Harvest neural rosettes by aspirating spent medium. Add 1 ml of pre-warmed DMEM/F12 to each well to remove unattached cells (repeat if necessary).

2.7 Add 1 ml of Neural Rosette Selection reagent to each well and incubate for up to 01:00:00 at 37 °C (check cells at 00:20:00 . Cells are typically collected after 30-45 min incubation. Look for rosette structure to be rounding up without the disturbance of other surrounding cells).

2.8 Carefully remove Neural Rosette Selection reagent with a pipet, being careful not to disturb rosette clusters. Add 1 ml DMEM/F12 to each well, then using a p1000 detach rosette clusters by rinsing over them.

2.9 Transfer rosette material from 1 well into a 15 mL conical tube for cryopreservation of neural rosettes and from 2 wells into a separate 15 mL conical tube for neural progenitor expansion. Do not triturate clusters.

To maintain a pure culture, it is best to leave some rosettes behind rather than collect all of the rosettes and additional cells.

2.10 Centrifuge rosette clusters at 750 rpm for 00:03:00 .

3 Add 1.5 ml of neural induction media supplemented with 1.5 ml of 2x neural freezing medium to the single well collection of neural rosette clusters. Gently mix solution and distribute 1 mL into sterile cryovials.

4 Store cryovials at -80 °C for at least 48:00:00 then transfer to liquid nitrogen for long-term storage.

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