Primary Mouse Astrocyte Isolation

Trypsin-based isolation of astrocytes from neonatal or adult mouse brain

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Overview

This protocol describes the isolation and culture of primary astrocytes from mouse brain. Astrocytes are the most abundant glial cell type in the brain and play critical roles in neuronal support, synaptic function, and CNS homeostasis.

Workflow Summary:

- **Step 1:** Euthanize mouse and harvest brain
- **Step 2:** Remove meninges
- **Step 3:** Trypsinization (15 min)
- **Step 4:** Trituration and neutralization
- **Step 5:** Centrifugation and plating
- **Duration:** ~1-2 hours from dissection to plating
- **Culture time:** 7-14 days for confluent astrocytes

Applications

- Neuron-astrocyte co-culture studies
- Inflammatory response assays
- Metabolic studies
- Reactive astrogliosis modeling
- Drug screening
- Astrocyte-specific gene expression

Key Features

- Simple trypsin-based dissociation
- High purity (>95% GFAP+)
- Best from P0-P2 neonatal mice
- Can be used from adult mice (lower yield)
- Cells maintain astrocyte phenotype
- Can be passaged 2-3 times

Age Considerations:

- **P0-P2 (neonatal):** Highest yield, easiest dissociation, preferred
- **P7-P10:** Good yield, slightly more difficult
- **Adult (>P21):** Lower yield, requires longer digestion, more debris

Safety & Animal Care

- Ensure proper IACUC approval for all animal procedures
- Follow institutional guidelines for animal euthanasia
- Work in biosafety cabinet for sterile technique
- Wear appropriate PPE: lab coat, gloves, eye protection
- Dispose of animal carcasses according to institutional policy
- Genotyping: Save tail clip if needed for genotyping