

E20 Primary Rat Hippocampal Cells

Catalog Number: PC35108 **Components :** • **Approximately 1 x 10⁶** (2 mls) E18 Sprague/Dawley neurons.
• **12 mls Culture Media-** Neurobasal/B27/0.5 mM glutamine/25 µM glutamate culture medium, **5 mls Hibernate Shipping Media**

Description: Primary Rat Hippocampal Cells are live neurons isolated from micro-surgically dissected regions of day 20 embryonic Sprague/Dawley rat brain. These cells are prepared fresh each week and shipped in a nutrient rich medium that keeps the cells alive for up to 7 days under refrigeration. The cells are ideal for a wide variety of applications including: transfection, pharmacology, electrophysiology, immunocytochemistry and neuronal development studies.

Shipping/Storage: Primary Rat Hippocampal Cells are shipped refrigerated. Cells are stable for up to 7 days when stored at 4-8°C. It is recommended to plate the cells as soon as possible after receiving cells according to Application Notes outlined below.

Application Notes

Materials Needed Not Provide

- Poly-D-lysine (Sigma P6407) for substrate
- Papain (Worthington or Sigma P4762) for enzymatic dissociation
- Trypan blue to count cells to get proper plating density
- Sterile pipette tips or sterile Pasteur pipette
- Sterile centrifuge tubes
- Centrifuge to operate at 200xg
- Water bath at 30°C
- General cell culture supplies (culture plates, coverslips, etc.)
- Additional media
 - Neuromics' [NbActiv1-M36109](#)
 - OR
 - Neurobasal/B27 **without glutamate** Glutamine (Invitrogen 35050-061)

Preparation (Room Temperature in a Sterile Hood)

1. Prepare substrate by coating with 50 µg/ml poly D-lysine (0.15 ml/cm²) (Sigma P63407). Incubate coated surfaces for at least 1 hour (up to 20). Aspirate the poly-D-lysine, rinse once with ddH₂O, aspirate and air dry.
2. Prepare cell dissociation solution by dissolving 6 mg sterile papain in 3 ml of Hibernate E-Ca (HE-Ca) without B27 (Neuromics M36101-5 supplied) for a final working concentration of 2 mg/ml. Incubate for 10 minutes at 30°C to dissolve.
3. Fire polish the tip of a sterile 9" silanized Pasteur pipette to an opening of ~0.5 mm
4. Aliquot 80 µl of Trypan Blue (Sigma T8154) into a 0.5 mL tube for Step 9.

Cell Dispersal (Room Temperature in a Sterile Hood)

1. With the silanized Pasteur pipette, carefully transfer HEB solution to a sterile tube (save for Step 3) leaving tissue with minimal HEB
2. Add 2 ml of cell dissociation solution to the tissue and incubate for 10 minutes at 30°C. Gently swirl every 5 minutes
3. Remove cell dissociation solution leaving the tissue at the bottom. Return HEB from Step 1
4. With the silanized Pasteur pipette, triturate tissue for about 1 minute (90% tissue dispersal) avoiding air bubbles
5. Let undispersed pieces settle for 1 minute
6. Transfer supernatant containing dispersed cells to a sterile 15 ml tube. Leave ~50 µl of HEB containing debris
7. Spin 1100 rpm (200 x G), 1 minute. Discard supernatant leaving ~50 µl of HEB containing the pellet.

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8. Disperse the pellet of cells (flick the bottom of the tube with a finger) and resuspend pellet in 1 ml NbActiv1™
9. Aliquot 20 µl of cell solution into the 0.5 ml tube containing 80 µl of Trypan Blue (1:5 dilution)
10. Count cells using a hemacytometer (calculate cells/ml)

Cell Plating (Room Temperature in a Sterile Hood)

1. Dilute cells with NbActiv1™ (0.2 ml/cm²) and plate at 16,000 cells/cm² or desired concentration.
2. Incubate 37°C, 5% CO₂, 9% O₂, 95% humidity (or ambient O₂)
3. After 4 days, neurons display axons and dendrites; synapses and action potentials begin at 7 days.
4. Change ½ of the medium with fresh, 37°C, CO₂ equilibrated NbActiv1™ every 3-4 days.
 - a. Additional media and media supplements will need to be purchased to culture neurons past 4-6 days.

Viability Assay

1. Rinse cells twice with PBS.
2. From an acetone stock of 15 mg/ml fluorescein diacetate (Sigma), add 15 µl (1:100 dilution of the stock) into 1.5 ml HBSS. From an aqueous stock of 4.6 mg/ml propidium iodide, add 15 µl of the stock into the same 1.5 ml HBSS (1:100 dilution). Add 40 µl of that dilution to each well with 0.4 ml HBSS (further 1:100 dilution).
3. After approximately 1 minute, count using Nikon B1A filter or other blue excitation appropriate for fluorescein fluorescence. Green cells are alive. Small red nuclear stain indicates a dead cell.
4. If desired, fix and stain with 0.25% Coomassie blue R in ethanol/HAc/water (45/10/45), 1 min., rinse with 10% HAc, aspirate and dry.

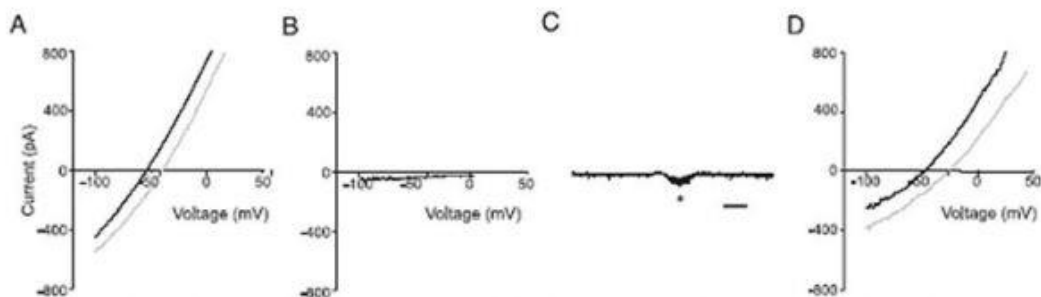
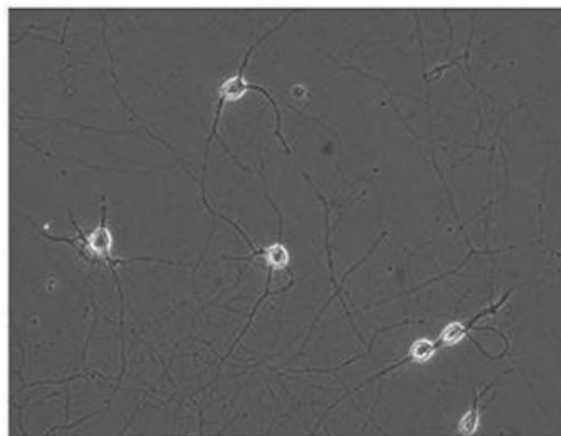


FIG. 9. NO-induced shift in E_{Cl^-} occurs in rat hippocampal neurons. **A:** GABA-gated currents recorded from a hippocampal neuron during voltage ramps before (black trace) and after (gray trace) NO application. (ruptured-patch, normal hippocampal external and internal solutions). **B–D:** current records elicited by the voltage protocol depicted in Fig. 7B. **B:** GABA-gated current collected in 0 external Cl^- . **C:** NO-dependent current (asterisk) recorded in 0 chloride indicates timing of NO arrival. Scale bar, 2 s. **D:** after returning to normal (TEA-H) external solution, a shift in E_{GABA} is revealed. The gray trace is recorded 30 s after return to normal $[Cl^-]_o$, and the black trace is recorded 1 min after return to normal $[Cl^-]_o$. Recordings in A–D are from the same cell. Recordings were made in the ruptured-patch configuration with TEA-H or 0 Cl^- -H external solutions and Cs⁺-H internal solution.

Hippocampal Neurons-1 Week in Culture. Courtesy of Emily McMains (Gleason Lab), LSU



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