

IN VITRO ASSAYS FOR NEUROSCIENCE

EXPERIMENTAL PLATFORMS

ELECTROPHYSIOLOGY PLATFORMS

- Automated Qpatch-48
- Manual Patch Clamp EPC10 USB, 700B
- Multi-electrode Array MED64 System

MORPHOLOGY PLATFORMS

- Confocal laser scanning microscope
- High content image analysis system

ION CHANNEL TARGET ELECTROPHYSIOLOGICAL TESTING

VOLTAGE-GATED

- (Na+), Nav1.1, Nav1.5, Nav1.7
- (K+) hERG, Kir2.1, Kv1.5, Kv4.3, Kv7.1
- (Ca2+) Cav1.2

ION CHANNELS ON PRIMARY NEURONS

- DRG neuron
- Hippocampal neuron
- Cortical neuron

LIGAND-GATED ION CHANNELS

- 5-HT3
- GABAaR (α1β2γ2)
- nAChR (α4β2)
- NMDA (GRIN1/GRIN2B)
- TRPR (TRPV1, V3, C6)

CELL ASSAYS BASED ON PRIMARY NEURONS

NEURITES GROWTH TESTING

- Paclitaxel-induced neurites degeneration of DRG neurons
- Neurites growth testing in hippocampal neurons

CELL MODEL ASSAYS

- Cell oxygen-glucose deprivation (OGD) model assay of cortical neurons
- Oxidative stress model assay of cortical neurons

NEURITE GROWTH TESTING IN HIPPOCAMPAL NEURONS





- Neurites counted by IF staining (β3-Tublin) then analyzed by PE Harmony system
- Readout showed neurites were grown in response to culture days

ELECTROPHYSIOLOGY BASED ON BRAIN SLICES

VARIOUS BRAIN REGIONS

- Hippocampus (CA1, CA3, DG)
- Frontal cortex
- Cortex-Striatum
- Nucleus Accumbens
- Amygdala
- Interpeduncular nucleus

NEURONAL EXCITABILITY

- Rodent brain slices
- Manual patch clamp (Axon)
- Interneuron and pyramidal neuron
- Threshold
- Action potential numbers
- Currents

POST-SYNAPTIC CURRENT

- Rodent brain slices
- Manual patch clamp (Axon)
- Pyramidal neuron
- Frequency and amplitude
- HIPPOCAMPUS STRIATUM MEDIAL PREFRONTAL CORTEX NUCLEUS

CASE STUDIES

PACLITAXEL-INDUCED NEURITES DEGENERATION OF DRG NEURONS READOUT WITH OPERETTA CLS HIGH CONTENT IMAGE ANALYSIS SYSTEM



100 nM Paclitaxel

150 nM Paclitaxel

200 nM Paclitaxel





EPILEPTIFORM ACTIVITY FIRING INDUCED BY HIGH CONCENTRATION KCL ACSF (WISTAR)









CASE STUDIES

BRAIN SLICE LTP RECORDING IN DIFFERENT BRAIN REGIONS



SPINE DENSITY WITH GOLGI STAINING

Decreased spine density of pyramidal neurons in hippocampal CAI in 9 month old 5XFAD mice







CASE STUDIES

PRE/POST-SYNAPTIC ELEMENTS SV2A AND PSD95 IN HIPPOCAMPAL CAI





AAV-GFP TARGETED EXPRESSION IN COCHLEA INNER HAIR CELLS OF C57 MICE

AAV-GFP introduced by intralabyrinth infusion achieved targeted expressed in inner hair cells



AAV-GFP EXPRESSION IN EX PLANTED COCHLEA TISSUE

AAV-XXX expression in inner hair cells, some outer hair cells, and many non-sensory cell types



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