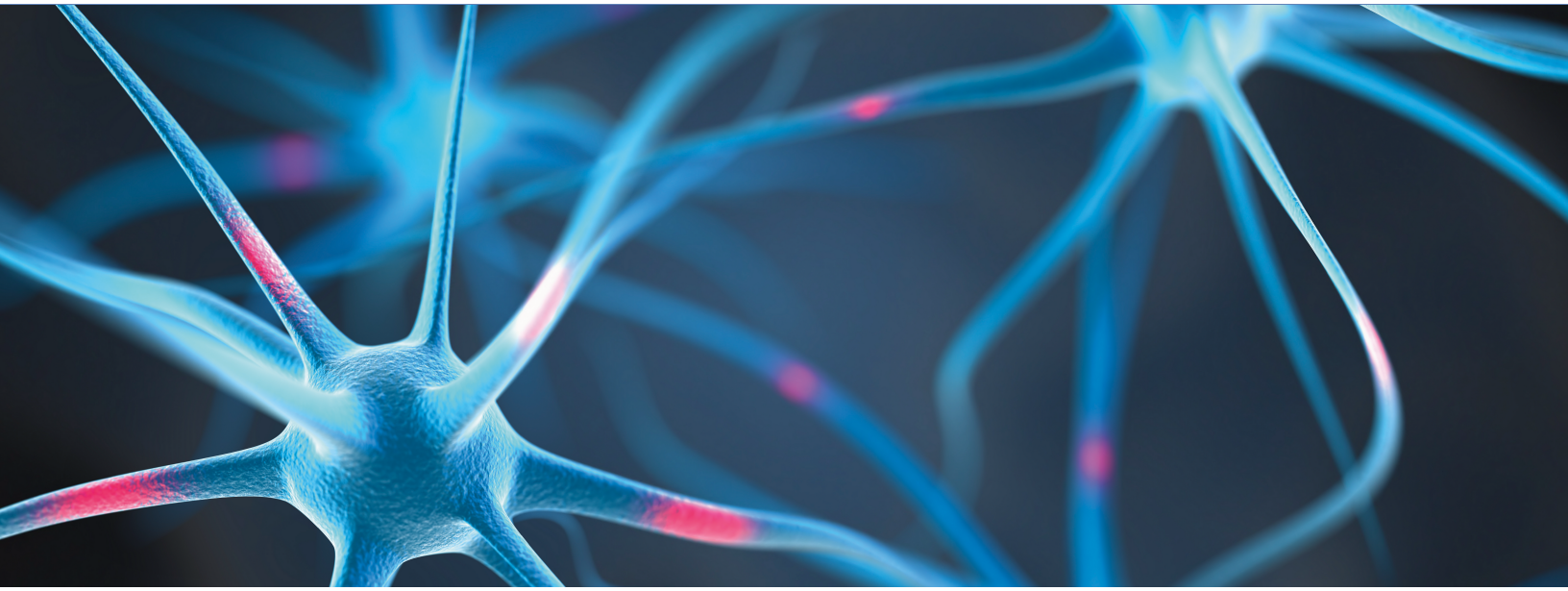
StemRNA™ Neuro

From Stem Cells to Human Neurons

stemgent
A REPROCELL BRAND



Functional Human Neurons

The advent of induced Pluripotent Stem (iPS) cells made research into live human brain cells an ethical possibility. REPROCELL's **StemRNA™ Neuro** technology (formerly ReproNeuro) differentiate cells into a mixed population of human neuronal cell types.

Two Alzheimer disease-models are also available, one which is patient-derived and the other an engineered mutation. We recommend using **Neuro Culture Medium** or **Neuro MQ Medium** to culture StemRNA™ Neuro cells.

StemRNA™ Neuro Human Neurocytes	
World's first commercially available iPSC-derived human neurons	Observable functional electrophysiology by MEA or patch-clamp
Easy to use and culture; enough cells are provided for one full 96 well plate	Available as patient-derived or engineered mutants of Alzheimer disease
Phenotypically mature after two weeks in culture	Offer highly consistent performance and low lot-to- lot variation due to clonal derivation
Display highly complex networked morphology with synaptic junctions	Possess a stable phenotype and functionality up to several months in culture
Supplied as a frozen vial of late stage neuroprogenitor cells in cryopreservation medium	Derived from a healthy 32-year-old male donor

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StemRNA™ Neuro Functional Properties

One vial of StemRNA™ Neuro contains at least 3 × 10^6 viable cells. This is enough to seed a confluent 96-well culture plate. When plated and grown for at least two weeks in Neuro Culture Medium (RCDN101), the StemRNA™ Neuro cells form a network of mature neurons that develop increasingly dense synaptic connections over time. Figure 1 demonstrates the different types of neurons present in this mixed population of cells – including dopaminergic, cholinergic, glutaminergic and GABAergic neurocytes.

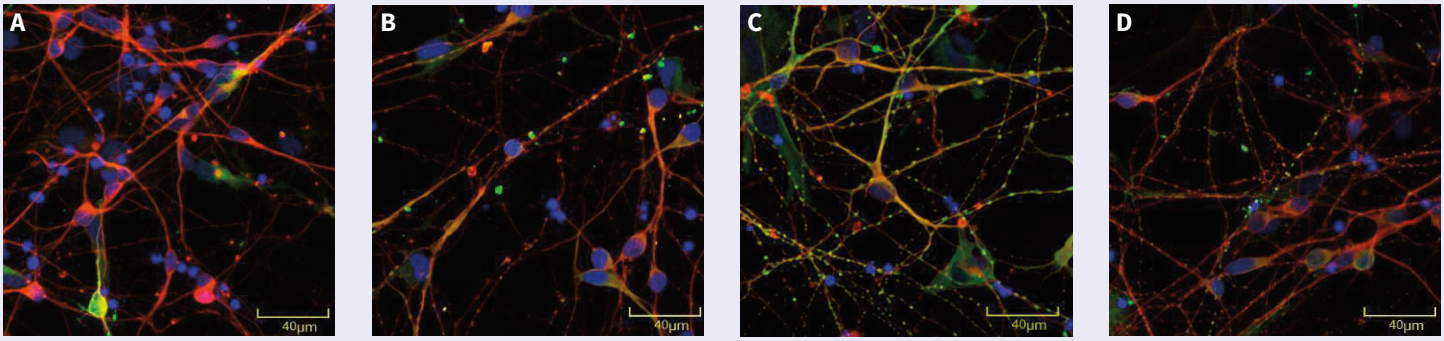


Figure 1: StemRNA™ Neuro in culture. *All panels were stained with a fluorescent βIII-tubulin antibody and one other neurosubtype specific antibody.* ***A:*** *probed for anti-tyrosine hydrolase specific for dopaminergic neurons (TH);* ***B:*** *probed for anticholine acetyltransferase specific for Cholinergic neuron (ChAT);* ***C:*** *probed for vesicular glutamine transporter 1 specific for Glutamatergic neurons (Vglut1);* ***D:*** *anti-GABA specific for GABAergic neurons (GABA).*

Our StemRNA™ Neuro Product Portfolio

StemRNA™ Neuro MQ Medium

- MEA-Qualified (MQ), high-performance culture medium
- Robustly detects spontaneous electrical action potentials when analyzed with Multi-Electrode Array (MEA) instrumentation
- Enhanced magnitude and frequency of spontaneous electrical activity due to the addition of rat astrocyteconditioned medium
- Useful for investigation of *in vitro* modification of electrical
- activity by drugs or other factors.

Custom-Engineered Human Neurons

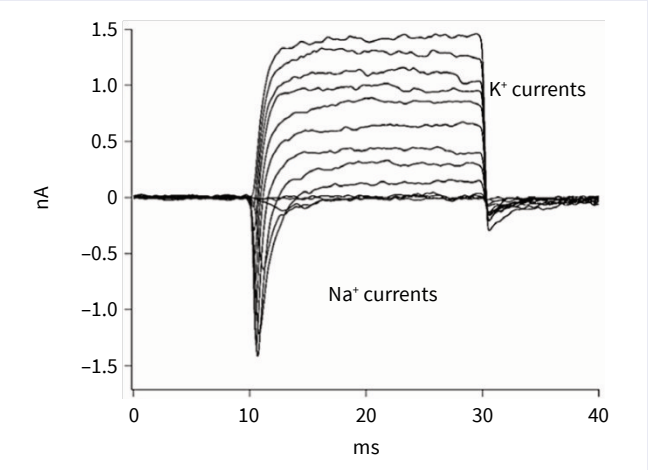
- REPROCELL's technology experts routinely make induced pluripotent stem cells (iPSC) lines and differentiated cell types
- Custom iPSC lines will be of the highest quality, stability and pluripotency
- We can provide control stains, specific genetic backgrounds, demnetia disease models, or genome edited cell lines, sourcing human tissue for you from our network of collection sites through Bioserve.

Product Name	Quantity	Catalog Number
StemRNA Neuro Human iPSC-derived Neurons	1 vial (3 × 10^6 cells)	RCDN001N
StemRNA Neuro AD-mutation	1 vial (3 × 10^6 cells)	RCDN002N
StemRNA Neuro AD-patient	1 vial (3 × 10^6 cells)	RCDN003P
Neuro Culture Medium	40 mL	RCDN101
Neuro MQ Medium	40 mL	RCDN102
Neuro Coat	150 µL	RCDN201
Stemolecule Y-27632	2 mg 10 mg	04-0012 04-0012-10

Examples of StemRNA™ Neuro in Action

1. Auto Patch Clamp Validation

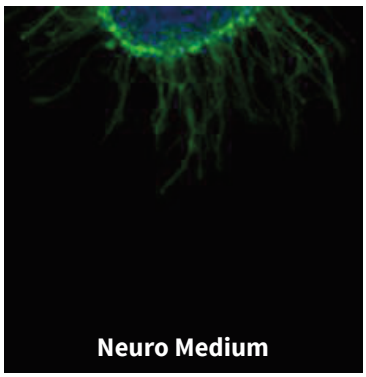
StemRNA™ Neuro cells exhibit typical potassium outward and sodium inward ion current. Data was collected on the Nan]i[on Patchliner instrument. A holding potential of –80 mV with step protocol at 10mV increments up to +40 mV is shown on the right.

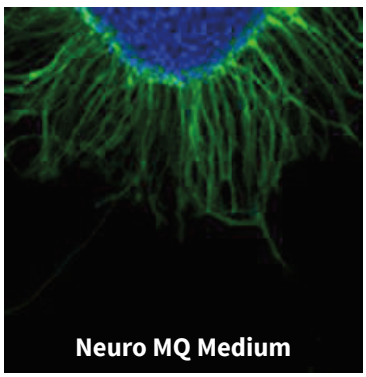


2. Neuro MQ Medium Enhances Neurite Outgrowth in 2D Cell Culture

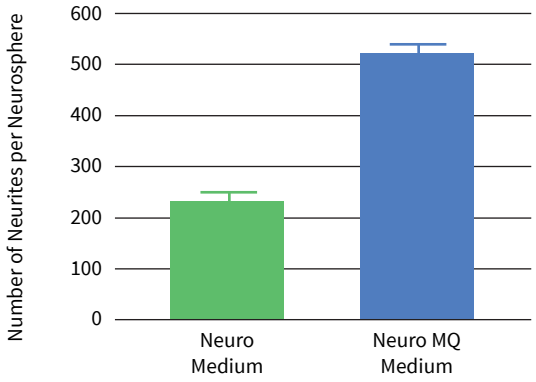
StemRNA™ Neuro cells were convert ed to neurospheres, and the neurospheres were stained with DAPI (blue) and anti-TUJ-1 (green) fluorescence detection reagents. Images were acquired (A) and neurites per neurosphere were determined using ImageJ software (B).

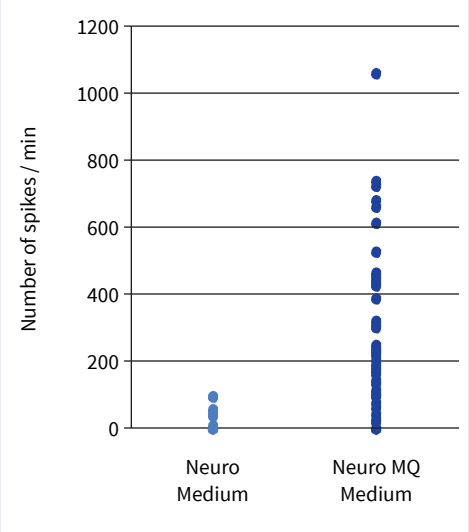
A

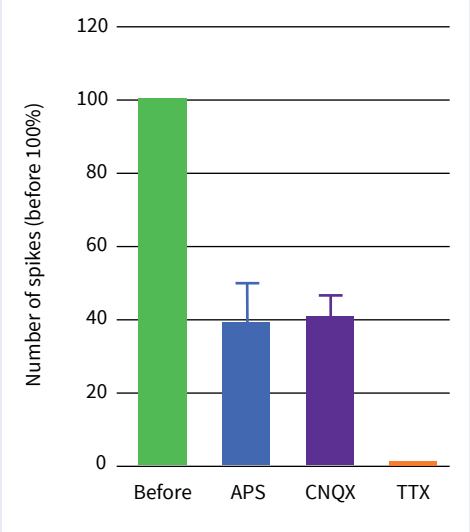




B







3.EMEA Analysis is Enhanced by Neuro MQ Medium

Action potentials for StemRNA™ Neuro cells are enhanced in frequency and intensity by maturation and growth in Neuro MQ Medium. The boosted activity allows for sensitive detection of drugs that down-regulate the spontaneous electrical potential correlating with published clinical data.

Human Neurons for Alzheimer's Disease Modelling

Our StemRNA™ Neuro range is not just limited to healthy tissues — we also offer neurons suitable for modelling Alzheimer's Disease (AD). Our human AD neurons come in two variants: AD-mutation and AD-patient. The first is StemRNA mutant carrying an engineered P117L mutation in the Presenilin 1 (PS1) gene. It expresses an aberrant Aβ42 peptide fragment characteristic of the AD3 (Type 3) familial form of Alzheimer's disease. The second was created from an iPSC strain derived from a 94-year-old male affected by AD. These cells express an R62H mutation with the Presenilin 2 (PS2) gene which is characteristic of AD4 (Type 4) familial form of AD.

Both models display functionality and can be used in neurite outgrowth assays to determine the efficacy and safety of your test articles (Figure 2 & Figure 3).

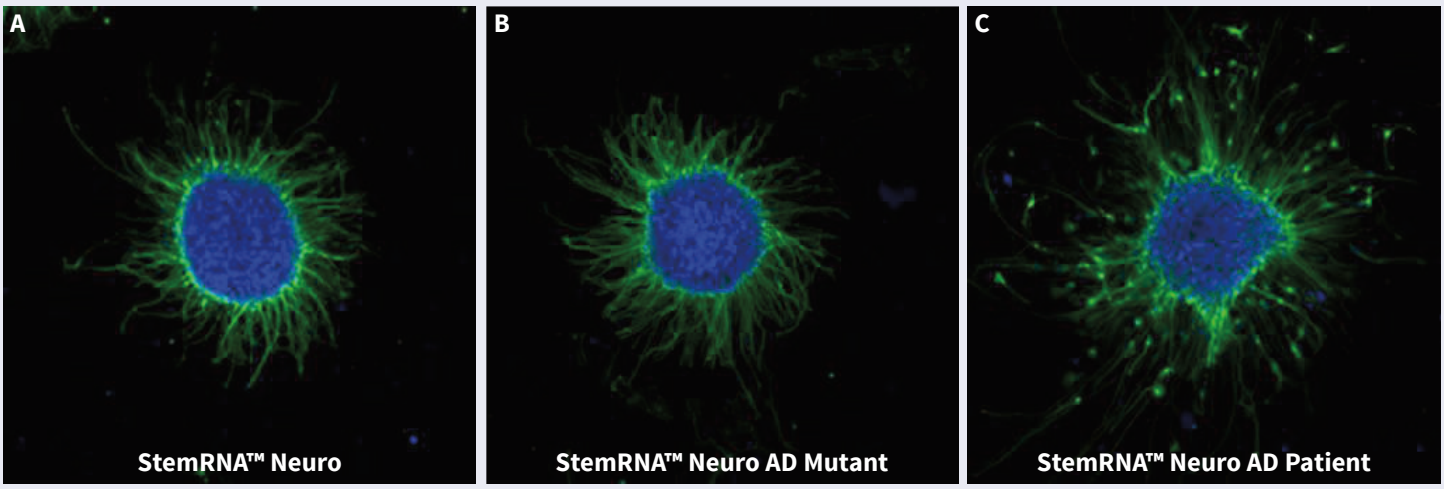


Figure 2: Neurite Outgrowth in 2D Culture. *Neurosheres created from StemRNA™ Neuro cells were stained with DAPI (blue) and anti-TUJ-1 (green) fluorescent detection reagents.* ***A:*** *Healthy StemRNA™ Neuro.* ***B:*** *Genetically-engineered model StemRNA™ Neuro AD-mutant.* ***C:*** *Patient-derived model StemRNA™ Neuro AD-patient.*

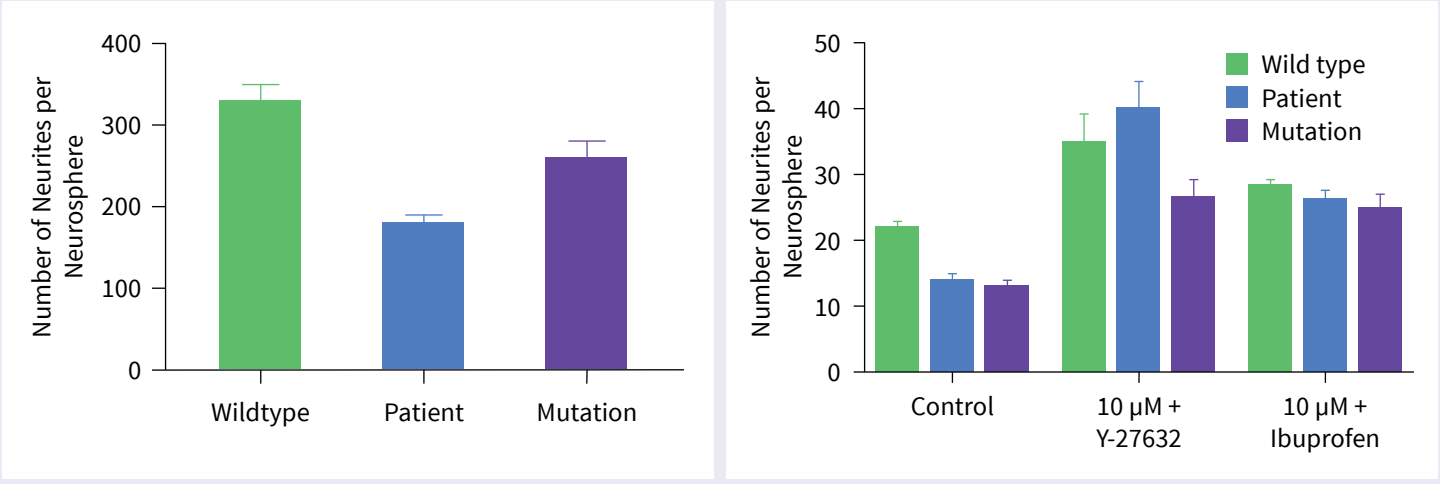


Figure 3: Functional Endpoints for Functional Cells. A: *ImageJ software analysis of Fig. 3's neurites per neurosphere for the wildtype, AD-patient, and AD-mutation StemRNA neurons.* ***B:*** *Inhibition of RhoA by ibuprofen and ROCK by Y-27632 (both previously shown to reduce Aβ40 levels) restores neurite outgrowth*