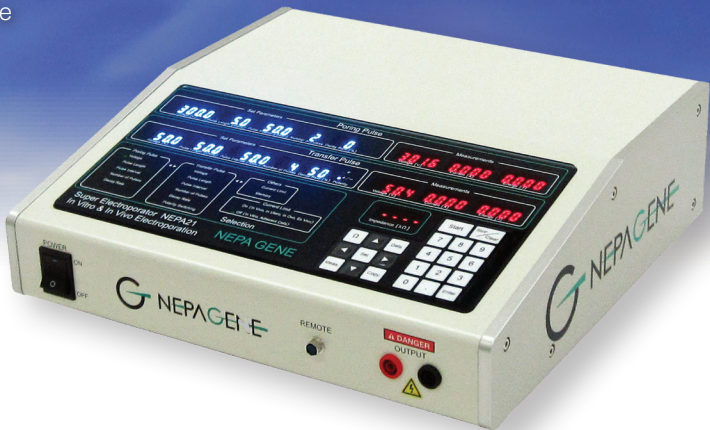


NEPA21

Electro-Kinetic Transfection System

Transfect Everything.

- ▶ **primary cells:** immune cells, stem cells, neurons and more
- ▶ **common and difficult cell lines:** RAW264.7, Jurkat, U2OS, and 100's more
- ▶ **transgenic zygotes**
- ▶ **organoids**
- ▶ **algae:** diatoms, Chlamydomonas and more
- ▶ **in adherence:** primary neurons, MEF, Neuro2A and more
- ▶ **in vivo:** organs, targeted tissues, whole embryos and more
- ▶ **in ovo:** chick embryos
- ▶ **in utero:** mouse embryos
- ▶ **ex vivo:** brain slices, ear cochlea, neural tubes and more



Bulldog
Bio

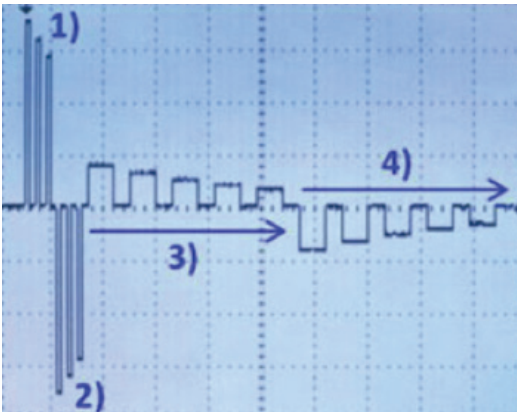


NEPA21

Electro-Kinetic Transfection System



A common misperception about the electroporation of cells in suspension is that it requires costly specialized chemicals — running as much as \$8 or more per sample. These additives can have unwanted effects on the cell and create another parameter which must be considered. Though electroporation has been around for many years, no protocols exist for high efficiency transfections without the use of such reagents. That is, not until the NEPA21. Nepa Gene has created THE most sophisticated apparatus for delivering DNA, RNA, and proteins into cells. Your cells stay in standard media, so all that's required are the reusable electrodes. With a combination of low voltage short-and-long pulses and unique polarity reversal, the NEPA21 can transfect a huge variety of cells, tissues, and even organisms with amazing efficiencies. This patented pulsing technology has been shown to be both superior to and far more flexible than other techniques. And because most living cells are not bothered by low voltages, and transfections can be done in standard growth media, cytotoxic effects are nearly eliminated.



Typical 4-Step Electro-kinetic Protocol

Novel 1-, 2-, 3- or 4-step Pulsing Technology

By creating complex patterns of square wave pulses, the NEPA21 can open pores in cellular tissues and then carry charged particles into these cells. The high amplitude, short duration Poring Pulse uses voltage decay to minimize damage to nuclear and cellular membranes (1). By reversing polarity of the Poring Pulse, the channels in the plasma membrane can be further stabilized (2). The lower-voltage longer-duration Transfer Pulses deliver DNA and RNA into the cells while continuing to ameliorate the cytotoxic effects (3). Significant improvements in transfer efficiency can also be generated by cleverly reversing polarity of the pulses (4).



In vitro transfection of suspension, adherent, and primary cells

The NEPA21 utilizes one of two electrode types to deliver nucleic acids to live cells in culture. The first type, for standard electroporation cuvettes, is used for suspension cells without the need for expensive buffering conditions with unknown additives. Simply add cells and pulse — then save money and time. For adherent cells, we offer a unique cell-culture plate electrode for 2-dimensional electro-kinetic transfer of RNA and DNA. The NEPA21 is the best option for efficacious transfection of primary cells. Stem cells, primary neurons, and immune cells all exhibit high cell viability and high transfection efficiency when pulsed by the NEPA21.

Gene editing for transgenic zygotes

Microinjection has been the traditional way to get nucleic acid machinery into zygotes. Electroporation has now proven easier, faster, and more effective. The TAKE method was developed with the NEPA21 and is a direct replacement of the microinjection technique. The alternative GONAD method obviates the need to harvest oocytes, directly electroporating eggs while they remain in a female mouse's oviduct. These mice can be mated naturally at greatly reduced costs by eliminating the need to individually handle hundreds of zygotes.

In vivo transfection in mice and rats

The NEPA21 is offered with more than 100 electrodes. These specialized tools can be used to gently pulse organs and tissues in live animals. This system allows previously difficult – or impossible – transfection experiments to be executed, opening new avenues of scientific inquiry. Transfections have been successfully performed on muscle, skin, liver, kidney, testis, ovary, brain, retina, cornea, and other organs. And if you need to study tissue outside of the organism, the NEPA21 offers specialized electrodes for the *ex vivo* transfer of nucleic acids to a variety of tissue explants including brain.

In utero, ex utero and in ovo transfections for developmental studies

Nepa Gene has developed tools and techniques for transfecting embryonic tissues – or even whole embryos – in mice, rats, and chickens. Whether it's specific regions in a mouse embryonic brain, a chicken cortex, or a rat leg muscle, we can provide a protocol and an electrode set. Flexibility is almost limitless, as these electrodes have been adopted for use with a variety of other animals and plants including honey bee, *Xenopus*, and even plant seeds. The unique “non-capacitor” design of the NEPA21 is perfect for tissues perfused in PBS or other saline solutions, as it allows for the delivery of perfect square waves even in the presence of salts.

Made for the toughest transfections

Organisms that have previously been found to be invulnerable to transformation kneel to the power of the NEPA21. Walled cells such as *Chlamydomonas* and diatoms have been successfully transformed using only the NEPA21. Additionally, *in vivo* gene editing components from CRISPR and TALEN have been shown to be most effectively transfected with NEPA21's complex pulsing patterns.

NEPA21

Electro-Kinetic Transfection System



SPECIFICATIONS

Size	346(W) x 330(D) x 113(H) mm	# transfer pulses	0-99
Weight	7.5 kg	Decaying pulses	Yes
Warranty	2 Year	Reverse polarity	Yes
Types of pulses	Poring & Transfer	Impedance readout	Yes
# pulsing steps	Up to 4	Total energy readout	Yes, in Joules
# poring pulses	0-9		

ITEM #	SIZE	DESCRIPTION	APPLICATION
NEPA21	1	NEPA 21 Electro-Kinetic Transfection System	Per electrode type. See below
CU500	1	Electrode chamber for electroporation cuvettes	Cells and cell clusters in suspension such as stem cells, immune cells, organoids, and all cell lines
CUY900-13-3-5	1	Electrode for 24-well culture plate	Adherent cells such as neurons
CUY505P5	1	Electrode on slide with parallel platinum plate electrode 8mm x 3mm, 5mm gap	Transgenic animal zygotes and tissue explants
CUY650P5	1	Tweezer-style electrode w/5mm ϕ platinum disk electrodes	<i>In vivo</i> EP of organs, muscle, skin, and mouse embryos
CUY652P2.5X4	1	Tweezer-style electrode w/ cupped platinum disk electrodes	Mouse oviduct for transgenic iGONAD
CUY611P7-2	1	Platinum chopstick-style electrodes, 7mm bend, 2mm tip length, 2/pkg	For targeted tissue <i>in vivo</i> such
CUY701P7E/7L	1	7mm x 7mm platinum square electrodes; one on stick and one on petridish w/1mm frame for tissue explants	For <i>ex vivo</i> EP using tissue explants

More than 100 other *in vivo*, *in utero*, *in ovo* and *ex vivo* electrodes available at www.bulldog.com

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Bio



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