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Transfection into Mouse-Rat: CULTURED EMBRYOS by Ex Utero Electroporation

The NEPA21 is the only device on the market to approach Electroporation from the perspective of optimising delivered energy.

- Compared to devices from other suppliers, the NEPA21 system offers the researcher a level of previously unavailable control over energy delivery to the electroporation target. This control is generated via unique electroporation pulse-output configurations, client-confirmed protocols and application-customised electrodes.
- With this market-leading control and (user-independent) reproducibility of the technique, it is now possible to apply electroporation techniques to applications previously considered too sensitive for electroporation methodologies.

- The finer control over the delivered energy offers specific and important advantages for CULTURED EMBRYOS electroporation. As the thrust of NEPA21 protocols is to minimise delivered energy, this means that the targets are electroporated with less current (than competing device protocols).
- Only delivering the required energy (and no more) to porate the membrane is of utmost importance for viability post electroporation.
- The success of the NEPA21 for retina electroporation is evident by the Application and Publication information following.
- The NEPA21 system is supported by a suite of over 250 different electrode configurations, which further enhance the applicability of the system and empower researchers with further experimental options and opportunities.

APPLICATIONS

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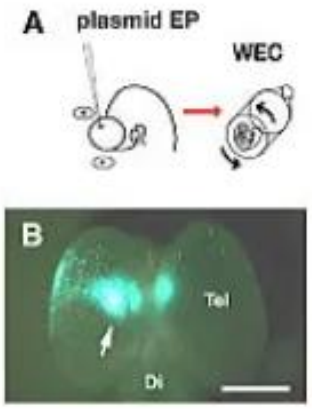
Electroporation for mammalian embryos in the whole embryo culture system

Procedure:

1. Pre-culture embryos in the whole embryo culture system for 1.5-2 hours prior to electroporation.
2. Place the embryo in a Petri dish with Tyrode's solution.
3. Inject 0.1-0.5 µl of plasmid DNA into the brain ventricle with a fine capillary.
4. Apply square pulses using the electroporator (NEPA21/CUY21) and electrodes (chamber-type and forceps-type electrodes are available). 70V, 50 msec at 1-second interval, five pulses are applied for E10.5 mouse embryos.
5. Culture the electroporated embryos for 24-48 hours in the whole embryo culture system. Transfection of a fluorescent protein-expression vector into the developing rat cortex

Transfection of a fluorescent protein-expression vector into the developing rat cortex.



(A) EGFP-expression vector was electroporated into E11.5 rat telencephalon. The electroporated embryo was cultured in the whole embryo culture system (WEC).

(B) 24 hours after electroporation, EGFP-expression was specifically detected at the dorsal part of the telencephalon.

Tel: telencephalon;
Di: diencephalon

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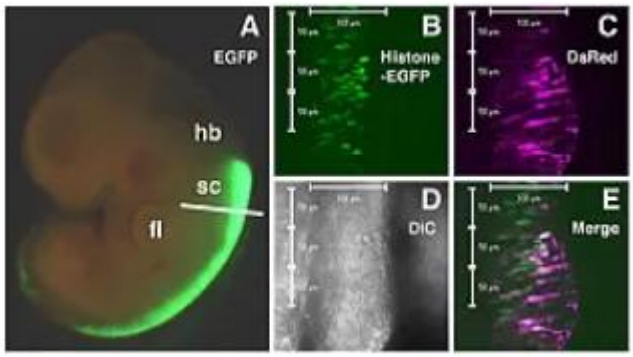
Transfection of fluorescent protein-expression vectors into the rat spinal cord.



(A) EGFP-expression vector was transfected into the spinal cord of E12.5 rat embryos by electroporation. The electroporated embryos were cultured for 24 hours in the whole embryo culture system (WEC).

(B-E) Time-lapse analysis of neuroepithelial cells in the slice culture system. Histon-EGFP- and DsRed2-expression vectors were co-electroporated into the E12.0 rat spinal cord. The electroporated embryo was cultured for 24 hours in the WEC, then the spinal cord was sliced and time-lapse recording was performed.
(B-E) Cell nuclei (B, green) and cytoplasms (C, magenta) of neuroepithelial cells in the slice are simultaneously labeled by the electroporation (E). (D) A DIC image.
hb: hindbrain; sc: spinal cord; fl: forelimb; DIC: differential interference contrast.

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PUBLICATIONS

Transfection into Mouse-Rat: CULTURED EMBRYOS by Ex Utero Electroporation

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