8th FENS FORUM OF NEUROSCIENCE
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ABSTRACT

Poster Instructions

Title	**(P023.07) High-Performance And Site-Directed *In Utero* Electroporation By A Triple-Electrode Probe** **Room: Poster Area - Session: P023 - Abstract Number: 1051 - Poster Board Number: G7** **Ref.: FENS Abstr., vol 7, p023.07, 2012**
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Session:	P023: Poster Session - Molecular and Genetic Techniques I Poster boards: G1-20
Date:	Sunday - July 15, 2012 11:15 - 13:15 (attendance: 7/15/2012 11:15:00 AM)
Location:	Poster Area
Subtopic:	G.1 Molecular and genetic techniques
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Theme:	G. Novel methods and technology development

From its introduction, *in utero* electroporation has been recognized as a powerful tool to manipulate neural-precursor cells of the parietal cortex and their progeny *in vivo*. Although this technique has unlimited potentials for targeting numerous brain areas, the experimental outcome appears to have been hindered so far by low reliability of transfection in some brain regions and by the inability to target other regions. Here, we present a new *in utero* electroporation configuration based on the use of three electrodes that overcomes the physical limitations of the standard bipolar configuration. We report how the proposed configuration allows for exceedingly reliable mono/bilateral transfection at different brain locations only sporadically targeted before, by simply adjusting the relative positions and polarities of the three electrodes. Indeed, we provide experimental evidence supported by a mathematical simulation, of the consistent improvement obtained in the efficiency of the electrical field distribution to target hippocampus motor cortex and visual cortex. The proposed multi-electrode configuration, in virtue of this increased efficacy of the electrical field also extends the developmental timeframe for reliable electroporation, allowing for the first time specific transfection of Purkinje cells in the cerebellum.