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Presentation Abstract

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Presentation Title: The three-electrode device: A new frontier for the in utero electroporation

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Abstract: The understanding of brain function requires the development of new methods to perturb and track distinct neuronal populations in the developing and adult central nervous system. Over the past ten years, *in utero* electroporation (IUE) has arisen as an extremely powerful tool to transfect and manipulate neuronal precursor cells of the parietal-cortex and their progeny *in vivo*. Although this technique has tremendous potentialities in targeting numerous brain areas, the results obtained so far have been generally hindered by low reliability of transfection in some regions and by the physical impossibility to reach other regions. Here, we present an innovative IUE configuration, which allows highly reliable transfection at various brain locations, including regions and cell types never targeted before. Our device, based on the usage of three independent electrodes upon an easy and highly reliable re-orientation of the electrode's positions and polarities, allows consistent expression of genes of interest in an array of brain areas including the hippocampus, the visual and motor cortices, and the cerebellum. Moreover, depending on the developmental stage of the embryos, it is possible to target distinct neuronal cell types, which may be particularly relevant in the cerebellum. The importance of such a tool in comparison to other methods arises in those particular applications where tissues and circuits integrity are essential points, and in those where traditional electroporation configuration is the limiting step of the experimental approach.

Disclosures: **G. Ratto:** Other; Patent TO2011A000411. **L. Cancedda:** Other; Patent TO2011A000411.

Keyword(s): CEREBELLUM
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