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# Experimental Characterization of Tissue Electroporation Based on the Feedback Signal of a New Measurement Method

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Pulsed electric fields have recently demonstrated their broad application potential in novel non-thermal minimally invasive techniques to treat cancer because of their unique biomedical and therapeutic effects. However, their practical clinical applications are limited by poor understanding of the interaction mechanism between pulsed electric fields and tissue, particularly in the process of electroporation and development. This paper proses a new measurement method to provide insight into the dynamic process of tissue ablation exposed to a pulsed electrical field. The tissue capacitance, cell membrane electroporation, and relaxation and resealing between the pulses are presented by analyzing the feedback signal of a measured pulse. Under the application of a pulsed electric field, complex electroporation occurs and the pulse parameters determine which dominates. For the traditional irreversible electroporation pulse with a width of 100 μs and a repetitive frequency of 1 Hz, the intensity of the electric field increases with an increasing number of pulses. The conversion from reversible electroporation to irreversible electroporation is the main form. Meanwhile, the release of electroporation between pulse intervals mainly occurred at the ms level. After 1s, the main electroporation form was irreversible electroporation. We are confident that the proposed measurement method can be expanded for using in both detailed experimental research of electroporation, and better teal-time observed degree of electroporation or treatment.

**Primary authors:** Dr LI, Chengxiang; LIU, Hongmei (Chongqing University); Dr MI, Yan (Chongqing University); Dr YAO, Chenguo

**Co-authors:** DONG, shoulong (Chongqing University); GONG, Lingyu; Dr LV, Yanpeng; Mr MA, Jianhao; ZHAO, Yajun (Chongqing University)

**Presenter:** LIU, Hongmei (Chongqing University)

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