# Precise electroporation ablation of arbitrary shape and volume

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## Technology description

Abstract
Tumor ablation is one of the common procedures for cancer treatment. Irreversible electroporation provides an effective way for tumor ablation by utilizing high-strength electrical field to introduce holes into the cell membrane and cause the apoptosis of malignant tissues. However, conventional electroporation medical instrumentation, designed for fixed ablation geometric profiles, cannot achieve the optimal treatment effect for tumors of arbitrary volume or shape. To overcome this issue, researchers at Northwestern University invented a novel electroporation device that allows for the accurate ablation of arbitrarily shaped tumors without impairing the surrounding healthy tissue. An image-guided computational system based on physical simulation has been developed for real-time monitoring as well as predicting the optimal device movement and electrical activation sequence. Therefore, allowing surgical oncologists to fully control the destruction of tissue, this medical device will revolutionize surgical and minimally-invasive oncological treatment.

## Application area

Cancer treatment
Non-malignant cyst or abscess/growth treatment

## Advantages

Ablates any arbitrary volume (can shape ablation profile to match desired volume)
Sharp ablation margin
Relatively low power required

## Institution

Northwestern University

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