



Spatio-Temporal Pacing and Recording for Evaluation, Induction, and Mapping of Arrhythmias

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SUMMARY

Researchers led by Marmar Vaseghi from the School of Medicine at UCLA have developed a high density electrode array to evaluate, induce, and map arrhythmias.

BACKGROUND

Cardiac arrhythmias are abnormal heartbeats that arise from malfunctions of electrical conduction in the heart. There are many tests to diagnose arrhythmias, but some diagnoses require their induction. These situations use multi-electrode arrays to induce arrhythmias through electrical stimulation. The same electrode arrays can also be used to localize the source of the arrhythmia to provide a target for ablation (destruction) therapies.

Currently, electrode arrays do not have enough electrode contacts to create an electrical map of the heart, and thus makes them inefficient for localizing the source of arrhythmias. These arrays can also only deliver electrical stimulation through one electrode which also makes the process of inducing arrhythmias for diagnostic purposes tedious and inefficient.

INNOVATION

Researchers led by Marmar Vaseghi from the David Geffen School of Medicine at UCLA have developed a high density electrode array to evaluate, induce, and map arrhythmias. This new electrode array has greater contact with the heart than previous arrays which allows for more reliable stimulation and recording. Their electrode array has a high density of electrode contacts to create a detailed electrical map of the heart and extract electrical properties that makes it easier to locate sources of arrhythmia.

Additionally, this new array can stimulate using multiple electrodes at once or in sequential order rather than using only one site like current electrode arrays. This makes the induction of arrhythmias for diagnostic purposes more efficient and can even be used while the patient is under anesthesia. Their arrays can be delivered through open chest surgery, a catheter, or an endoscope depending on which part of the heart the cardiologist wants to look at.

APPLICATIONS

- Mapping electrical conduction of the heart
- Induction of cardiac arrhythmias
- Localizing sources of arrhythmias
- Validation of clinical therapies

ADVANTAGES

- Higher density of electrodes
- Programmable, multi-site electrical stimulation
- Better contact with the heart
- More efficient at localizing and inducing arrhythmias

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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OTHER INFORMATION

KEYWORDS

Cardiovascular, heart, arrhythmia, electrode, electrode array, ablation, atrial flutter, electrical conduction, stimulation, recording

CATEGORIZED AS

- **Biotechnology**
 - Health
- **Medical**
 - Devices
 - Diagnostics
 - Disease: Cardiovascular and Circulatory System
 - Research Tools
- **Sensors & Instrumentation**
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