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Of Cardiac
Excitation And
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Optical Mapping Of Cardiac Excitation

Optical mapping of cardiac excitation using voltage- and calcium-sensitive dyes has allowed a unique view into excitation wave dynamics, and facilitated scientific discovery in the cardiovascular field. At

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the same time, the structural complexity of the native heart has prompted the design of simplified experimental models of cardiac tissue using ...

Macroscopic optical mapping of excitation in cardiac cell ...

Cardiac optical mapping is a fluorescent-imaging technique used in the study of the electrical

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properties of multicellular cardiac preparations (including the study of arrhythmia).

Applications range from imaging of monolayers of pluripotent stem-cell derived or neonatal cardiac myocytes to intact tissue preparations, including, muscle slices and isolated hearts.

An Introduction to
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Access Free Optical Mapping Of Cardiac **Cardiac Optical Mapping**

Cardiac optical mapping utilises fluorescent dyes to directly image the electrical function of the heart at a high spatio-temporal resolution which far exceeds electrode techniques. It has therefore become an invaluable tool in cardiac electrophysiological research to map the

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propagation of
heterogeneous
electrical signals
across the
myocardium.

Cardiac optical mapping - State-of- the-art and future ...

Optical mapping is
recognized as a
promising tool for the
registration of
electrical activity in the
heart. Most cardiac
optical mapping
experiments are

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performed in ex vivo
isolated heart models.

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The book Optical Mapping of Cardiac Excitation and Arrhythmias, edited by Drs. David Rosenbaum and José Jalife, explores in clear detail what optical cartography is and what its applications

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and principal contributions are to the study of cardiac activation and cardiac arrhythmias.

Optical Mapping of Cardiac Excitation and Arrhythmias ...

Simultaneous optical mapping system of endocardial and epicardial excitation
Abstract: The cardiac excitation propagation during arrhythmia shows a three-

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dimensional complex excitation behavior. Numerous optical measurements of the propagation and action potentials of the cardiac muscles have been made to elucidate the detailed arrhythmia phenomenon.

Simultaneous optical mapping system of endocardial and ...

Optical mapping of action potentials with orthogonal ChR2 or

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eNpHR3.0 excitation. A significant challenge was to record transmembrane potential via a voltage-sensitive fluorescent dye, while ...

Optical mapping of optogenetically shaped cardiac action ...

Cardiac tissue is an excitable system that can support complex spatiotemporal dynamics, including

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instabilities

(arrhythmias) with

lethal consequences.

While over the last two

decades optical

mapping of excitation

(voltage and calcium

dynamics) has

facilitated the detailed

characterization of

such arrhythmia

events, until recently,

no precise tools existed

to actively interrogate

cardiac dynamics in

space and time.

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All-optical control of cardiac excitation: combined high ...

While over the last two decades optical mapping of excitation (voltage and calcium dynamics) has facilitated the detailed characterization of such arrhythmia events, until recently, no precise tools existed to actively interrogate cardiac dynamics in space and time.

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All-optical control of cardiac excitation and combined high ...

The principles and techniques of cardiac optical mapping have been extensively reviewed (11, 17, 23). However, despite the recent proliferation of optical mapping laboratories and the increasing use of this technique, there is a deficiency in the literature about the standard methods for

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processing and analyzing cardiac optical mapping data.

Processing and analysis of cardiac optical mapping data ...

Optogenetic control of the heart is an emergent technology that offers unparalleled spatio-temporal control of cardiac dynamics via light-sensitive ion pumps and channels (opsins). This fast-

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evolving technique holds broad scope in both clinical and basic research setting.

Combination of optogenetics with optical mapping of voltage or calcium fluorescent probes facilitates 'all-optical ...

Frontiers | Cardiac Optogenetics and Optical Mapping ...

While over the last two decades optical mapping of excitation

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(voltage and calcium dynamics) (Efimov et al. 2004) has facilitated the detailed characterization of cardiac arrhythmias, until recently no precise tools existed to actively interrogate and manipulate cardiac dynamics in space and time.

All-optical control of cardiac excitation: combined high ...

Abstract: Optical

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mapping is recognized as a promising tool for the registration of electrical activity in the heart. Most cardiac optical mapping experiments are performed in ex vivo isolated heart models. However, the electrophysiological properties of the heart are highly influenced by the autonomic

Cardiac Optical Mapping in Situ in

Access Free Optical Mapping Of Cardiac **Swine Models: A View of ...**

Optical mapping is a high-resolution fluorescence imaging technique, that uses voltage- or calcium-sensitive dyes to visualize electrical excitation waves on the heart surface. However, optical mapping is very susceptible to the motion of cardiac tissue, which results in so-called motion

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artifacts in the
fluorescence signal. To
avoid motion artifacts,
contractions of the
heart muscle are ...

Frontiers | High-Resolution Optical Measurement of Cardiac ...

Despite its widespread use in basic research and implications to clinical cardiac electrophysiology, there are no definitive and authoritative

Access Free Optical Mapping Of Cardiac Excitation and Arrhythmias

sources of information on cardiac optical mapping. This is the first and only book to date that comprehensively, in a single volume, covers all aspects of the technique and application of optical mapping in the heart.

Optical Mapping of Cardiac Excitation and Arrhythmias ...

In cardiac tissues, simultaneous

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potentiometric dye fluorescence recordings from multiple sites have been made by arrays of photodiodes, photomultiplier tubes, laser scanning systems, charge-coupled device (CCD) cameras, and their more recent derivatives. 9 - 11 Furthermore, whole heart optical mapping techniques have been developed and utilized

Access Free Optical Mapping Of Cardiac to study electrophysiological mechanisms of ... Arrhythmias

Optical Imaging of Voltage and Calcium in Cardiac Cells ...

Optical mapping is a high-resolution fluorescence imaging technique, that uses voltage- or calcium-sensitive dyes to visualize electrical excitation waves on the heart surface.

However, optical

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mapping is very susceptible to the motion of cardiac tissue, which results in so-called motion artifacts in the fluorescence signal.

High-Resolution Optical Measurement of Cardiac Restitution

...

Optical mapping is a high-resolution fluorescence imaging technique, that uses

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voltage- or calcium-
sensitive dyes to
visualize electrical
excitation waves on
the heart surface.

(PDF) High-Resolution Optical Measurement of Cardiac ...

Existing cardiac optical mapping has used blue or green excitation light. This study has evaluated an alternative that may use near-infrared

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Cardiac optical mapping with a condensing lens and near-infrared light for two-photon excitation at depths up to 300 μm in hearts may provide significant improvement in localization over existing cardiac optical mapping.

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[d41d8cd98f00b204e98
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