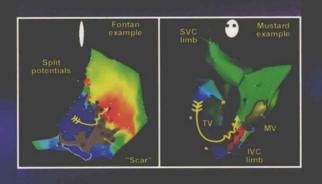
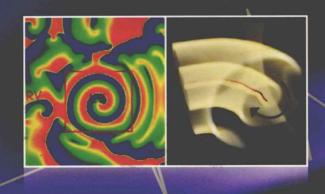
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CARDIAC ELECTROPHYSIOLOGY

From Cell to Bedside







Cardiac Electrophysiology From Cell to Bedside

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CARDIAC ELECTROPHYSIOLOGY: FROM CELL TO BEDSIDE

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Cardiac Electrophysiology

From Cell to Bedside

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The Sinoatrial Node: Its Complex Structure and Unique Ion Channel Gene Program; Mechanisms of Atrioventricular Nodal Excitability and Propagation

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KCNQ1/KCNE1 Macromolecular Signaling Complex: Channel Microdomains and Human Disease

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Catheter Ablation of Ventricular Arrhythmias in Patients without Structural Heart Disease

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Catheter Ablation in Pediatric and Congenital Heart Disease Patients

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KCNQ1/KCNE1 Macromolecular Signaling Complex: Channel Microdomains and Human Disease

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A New Functional Paradigm for the Heart's Pacemaker: Mutual Entrainment of Intracellular Calcium Clocks and Surface Membrane Ion Channel Clocks Paul D. Lampe, PhD

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Sudden Cardiac Death in Athletes, Including Commotio Cordis

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Voltage-Gated Sodium Channels and Electrical Excitability of the Heart

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A New Functional Paradigm for the Heart's Pacemaker: Mutual Entrainment of Intracellular Calcium Clocks and Surface Membrane Ion Channel Clocks

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Neural Mechanisms Initiating and Maintaining Arrhythmias: Summarizing Data from Animal Models and Human Diseases

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Fibrosis and Fibroblast Infiltration: An Active Structural Substrate for Altered Propagation and Spontaneous Tachyarrhythmias

Preface

In the five years since the fourth edition of this book was published, advances in cardiac electrophysiology have been impressive. A broadening understanding of the fundamental electrophysiologic mechanisms underlying normal and abnormal cardiac excitation and impulse propagation is emerging, thanks in part to leapfrog improvements in technology, from the use of voltage clamping and the Ling Gerard microelectrode, through patch clamping and molecular biology, to optical mapping, computer modeling, and molecular genetics. A wide variety of basic mechanisms of normal and abnormal cardiac excitation, impulse propagation, and arrhythmias have been well described as a result of such improvements. In addition, basic cardiac electrophysiology has contributed to identification of disease loci for currently known mutations in proteins that form sarcolemmal and sub-sarcolemmal ion channels, discoveries that have greatly improved current understanding of the substrate for cardiac arrhythmias in both inherited and acquired diseases. The first part of Cardiac Electrophysiology: From Cell to Bedside addresses all of these issues and offers a conglomerate of comprehensive reviews on modern concepts in basic cardiac electrophysiology. This in-depth background is provided to help the reader integrate knowledge from the molecular to the organ level and to support translation of that knowledge into clinical practice.

The second half of the book focuses on clinical progress, which has been equally remarkable, with continued elucidation of pathophysiologic mechanisms responsible for many arrhythmias, including the different types of atrial fibrillation and many ventricular tachyarrhythmias, as well as new approaches to their management. Development of drugs, devices, and ablation techniques continues to advance at a startling pace. Perhaps no area has progressed as much as research into the genetic underpinning of many arrhythmias, not just those clearly related to ion channel abnormalities such as long and short QT syndromes, catecholaminergic ventricular tachycardia, right ventricular and

hypertrophic cardiomyopathies, and Brugada syndrome, but the more common arrhythmias such as atrial fibrillation, ventricular tachycardia, and those related to sudden cardiac death. The growth of new imaging modalities has been breathtaking and has kept pace with the need for better pictures of cardiac anatomy, particularly of the left atrium and pulmonary veins. Advances in recording electrical signals from the heart can be marked by three phases: development of the electrocardiograph, catheter-based intracardiac recordings, and now ECG imaging. The last phase has opened a new era into noninvasive assessment of cardiac activation.

The format of the book continues to evolve as well. The use of color throughout maximizes accessibility of information presented in the figures and diagrams, as well as providing a more attractive appearance overall. In addition, the electronic format facilitates availability for ready reference. As before, the authors of the chapters are the leaders in their areas, and we are pleased that they consider writing for *Cardiac Electrophysiology: From Cell to Bedside* a happy task. We thank them for their contributions, which continue to make this book an important reference text for basic and clinical scientists, clinicians, and general cardiologists. We strive to craft it as the all-inclusive knowledge source, literally "from cell to bedside," for those interested in heart rhythms. We think it is one of the few books accomplishing that goal with such an authoritative list of experts.

Finally, we thank our wives, Joan Zipes and Paloma Jalife, whose constant support allows us to undertake such endeavors as this, and the people at Elsevier, particularly Natasha Andjelkovic, Janice Gaillard, and Jeff Gunning, for all their help.

In the final analysis, the reader determines the success or failure of a book, and we are pleased that so many of you liked the previous editions and have made this publication an important part of your educational resources. We hope that this edition meets your expectations equally well.

> Douglas P. Zipes José Jalife

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