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# **CARDIAC ENERGETICS: FROM $E_{max}$ TO PRESSURE-VOLUME AREA**

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## Preface

The energetics of cardiac muscle and whole heart contraction have fascinated scientists and clinicians for many years. There are undoubtedly many reasons for this. Problems are seemingly tractable because muscle contraction has a more readily quantifiable, biophysical basis compared to many other areas in biology. Thus, researchers interested in cardiovascular modeling find this a challenging, yet fruitful area. Similarly, those interested in structure-function relationships have been intrigued by the links between the mechanical performance of molecular "motors" and energy consumption. Cardiac energetics is also an area in which it has been increasingly possible to relate discoveries at a very basic level to the performance of the whole, integrated organ. Finally, the clinical relevance of alterations in energy utilization in cardiac hypertrophy and failure, both as a "window" with which to understand basic mechanisms and as potential therapeutic targets, has been widely recognized.

As a reflection of the increasing interest in and progress made in cardiac energetics, especially over the last 10-15 years, the Japan-USA Cardiac Energetics Workshop was held at Okayama University, Okayama, Japan, in February 1994. Much of the progress made during this period of time has been spurred by the pressure-volume area concept, the natural extension into energetics of earlier, pioneering work delineating the time varying elastance framework for ventricular contraction. The title of this volume reflects this linkage. The organizers of the Workshop attempted to bring together a spectrum of researchers, basic, applied and clinical, with a shared interest in the energetics of cardiac muscle and ventricle, in order to provide an overview of the current "state of the art". The Workshop was lively, informative and provocative. We hope that this volume, which includes chapters by virtually all of the participants, reflects the excitement of the Workshop and will be valuable to scientists and clinicians alike. The editors are indebted to the Workshop participants and their colleagues for making this volume possible. In addition, the support of the Suzuken Memorial Foundation, Nagoya, Japan, the

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