

Smooth Muscle Contraction



MLCK = Myosin light chain kinase
MLCP = Myosin light chain phosphatase
GTP = Guanosine triphosphate
cGMP = Cyclic guanosine monophosphate

Smooth Muscle Contraction New Regulatory Modes

Takeshi Nakano, David J. Hartshorne



Smooth Muscle Contraction New Regulatory Modes:

Smooth Muscle Contraction Kazuhiro Kohama, Kooichi Saida, 1995 *Smooth Muscle Contraction* K. Kohama, K. Saida, 1995-03-15 Regulation of the Contractile Cycle in Smooth Muscle Takeshi Nakano, David J. Hartshorne, 2012-12-06

At the Mie International Symposium held in Japan in April 1994 leading scientists reviewed recent advances in the understanding of the contractile mechanism in smooth muscle. The present volume collects the papers presented at the symposium summarizing the latest advances in smooth muscle function and emphasizing important components of the contraction-relaxation cycle. Topics include a discussion of the smooth muscle cell membrane with emphasis on its ion channels, the regulation of cytosolic Ca^{2+} levels and the relationship to force in smooth muscle, aspects of the two key regulatory enzymes involved with myosin phosphorylation-dephosphorylation, the molecular basis for pharmacomechanical coupling in smooth muscle, developments in the basic contractile mechanisms involving the crossbridge cycle of tonic and phasic muscle, the role of myosin light chains and many others. The approach is broad and presents contemporary opinions in pharmacology, physiology and biochemistry as they relate to smooth muscle function. The book will appeal not only to those working in these disciplines but to vascular clinicians, obstetric-gynecological physicians and gastroenterologists as well.

Regulation of Smooth Muscle Contraction Robert S. Moreland, 2012-12-06 Sixth Annual Graduate Hospital Research Symposium

REGULATION OF SMOOTH MUSCLE PROGRESS IN SOLVING THE PUZZLE Every so often a scientific conference comes at a time when everyone has new and exciting information when old dogmas do not seem to be as well established and when speakers and participants alike are ready to challenge interpretations of old and new experimental data. This was such a conference. What turns on a smooth muscle cell? The precise answer to this question has eluded scientists for much longer than I have been involved in the field. We know that an increase in cytosolic calcium is necessary and we know that phosphorylation of the 20 kDa myosin light chain is an important step in the process. We do not know if other processes are necessary for the initiation and/or maintenance of a smooth muscle contraction nor do we know if other processes modulate the regulation of contraction. The goal of the symposium on which this volume is based was to explore the most current hypotheses for the answers to these questions. I believe that after reading the chapters included in this volume you will agree that this goal was achieved. The importance of calcium and calmodulin-dependent myosin light chain phosphorylation in the regulation of smooth muscle contraction was reinforced by many presentations. However, the status of myosin light chain phosphorylation as a simple calcium-dependent switch came under serious suspicion.

Current Basic and Pathological Approaches to the Function of Muscle Cells and Tissues Haruo Sugi, 2012-07-18 This volume contains 17 short review articles classified into 3 parts. Part I consists of 7 articles dealing with basic aspects of contractile mechanism in skeletal and smooth muscle cells and also function of melanocytes having many properties common to those of smooth muscles. Part II and Part III contain articles dealing with pathological aspects of cardiac and smooth muscle cell.

functions and dealing with factors influencing structure and function of cardiac and smooth muscle cells and tissues The Editor believes that these articles are stimulating and informative for readers interested in basic pathological and clinical aspects of muscle cells and tissues **Molecular Mechanisms of Smooth Muscle Contraction** Kazuhiro Kohama, Yasuharu Sasaki, 1999 **Calcium Inhibitors: A New Mode for Ca²⁺ Regulation** Kohama, 1992 Presents an overview of biological systems controlled by the calcium ion in a variety of cells including plant cells animal cells and lower eukaryotic cells The book discusses how the calcium ion not only activates but also inhibits enzymatic reactions in biological systems **Biological Signals**, 1994 Cellular Physiology and Biochemistry, 1995 **Acta Anatomica**, 1995 **Pharmacology**, 1995-07 Hormone Research, 1995 *Biomedical Index to PHS-supported Research: pt. A. Subject access A-H*, 1994 Medical Physiology E-Book Walter F. Boron, Emile L. Boulpaep, 2016-03-29 For a comprehensive understanding of human physiology from molecules to systems turn to the latest edition of Medical Physiology This updated textbook is known for its unparalleled depth of information equipping students with a solid foundation for a future in medicine and healthcare and providing clinical and research professionals with a reliable go to reference Complex concepts are presented in a clear concise and logically organized format to further facilitate understanding and retention Clear didactic illustrations visually present processes in a clear concise manner that is easy to understand Intuitive organization and consistent writing style facilitates navigation and comprehension Takes a strong molecular and cellular approach that relates these concepts to human physiology and disease Student Consult eBook version included with purchase This enhanced eBook experience includes access on a variety of devices to the complete text with thorough hyperlinking images 10 animations and copious linkout notes prepared by the Editors An increased number of clinical correlations provides a better understanding of the practical applications of physiology in medicine Highlights new breakthroughs in molecular and cellular processes such as the role of epigenetics necroptosis and ion channels in physiologic processes to give insights into human development growth and disease Several new authors offer fresh perspectives in many key sections of the text and meticulous editing makes this multi authored resource read with one unified voice **Research Awards Index**, 1988

Regulatory Mechanisms of Ca²⁺-activated Ion Channels and Their Impacts on Physiological/Pathophysiological Functions Yoshiaki Suzuki, Wayne Rodney Giles, Susumu Ohya, 2022-04-27 **Calcium in Muscle Activation** Johann C. Rüegg, 2012-12-06 This book offers a comparative and interdisciplinary approach to excitation contraction coupling in smooth and striated muscles including the myocardium It is an account of the pathways and mechanisms by which cellular calcium is handled and activates the contractile proteins It also describes how these mechanisms are adapted in various kinds of muscle to meet specific functional requirements such as speed or economy This monograph then presents facts ideas and theories and the evidence on which they are based and if it stimulates others and furthers research it will have served its purpose All of the chapters are self contained and may be read in any order but

readers unfamiliar with muscle are recommended to start with the introductory chapter on excitation and contraction During all the years of writing this book I received enormous help from Isolde Berger who corrected edited and transformed my innumerable notes and drafts into a readable manuscript she also compiled the list of references and the Subject Index I owe a great debt of gratitude to her and also to Claudia Zeugner who prepared the figures with expertise and care Then I would like to thank the Deutsche Forschungsgemeinschaft and the Fritz Thyssen Stiftung for supporting the work of my Department which has been reported in this monograph A great many people contributed with helpful discussions

Vascular Smooth Muscle: Metabolic, Ionic, and Contractile Mechanisms M.F. III Crass, 2012-12-02 Vascular Smooth Muscle Metabolic Ionic and Contractile Mechanisms addresses the vascular smooth muscle function by describing plasma lipoprotein structure synthesis and transport in relation to the concepts of altered vascular smooth muscle lipid metabolism leading to the genesis of atherosclerotic disease This book is organized into six chapters and begins with an introduction to the complexities of energy metabolism and how metabolic events can be correlated with a simultaneous quantitative assessment of smooth muscle mechanics and the contractile machinery at the molecular level The next two chapters offer the reader a view of smooth muscle membrane properties in terms of the distribution transport and metabolic control of electrolytes and specific aspects of ion conductance and electrical activity This text also explains how smooth muscle cells regulate their contractile activity through regulation of calcium ion fluxes and the interaction at the molecular level of calcium ions with regulatory proteins associated with the contractile apparatus Reference is made to the relation of possible anomalies in cellular or subcellular smooth muscle metabolic and or ionic events to the bases of certain types of vascular disease A chapter that examines the events leading to vascular pathology in the form of atherogenesis concludes the book This book is intended for researchers and clinicians engaged in the study of smooth muscle and related areas

Cumulated Index Medicus, 1974 **Smooth Muscle Spontaneous Activity** Hikaru Hashitani, Richard J. Lang, 2019-06-10 This book presents the commonality and heterogeneity of the mechanisms underlying smooth muscle spontaneous activity in various smooth muscle organs and in addition discusses their malfunctions in disease and their potential as novel therapeutic targets To facilitate understanding the volume is divided into five parts and covers 16 organs airways gastrointestinal tract phasic muscle tonic muscle renal pelvis ureter urinary bladder urethra corporal tissue prostate uterus oviducts seminal vesicle artery vein microvasculature and lymphatic vessels This structure will help readers to comprehend the most up to date information on the similarities and differences in the contractile mechanisms driving various smooth muscles as well as their potential manipulations in particular visceral organ pathologies The vast advancements in gene electrical recording and imaging technologies in this field are also discussed with review of past achievements and consideration of likely future developments This book will be of worldwide interest to clinicians students and researchers alike

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