

Editors: **T. Nakano**  
**D.J. Hartshorne**

# Regulation of the Contractile Cycle in Smooth Muscle



Springer

# Regulation Of The Contractile Cycle In Smooth Muscle

**Michael Barany**



## **Regulation Of The Contractile Cycle In Smooth Muscle:**

**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     *Airways Smooth Muscle: Biochemical Control of Contraction and Relaxation* David Raeburn, Mark A. Giembycz, 2013-11-11     Calcium Regulation of Cellular Function , 2000-04-01 Volume 30 examines the prominent role of calcium as an intracellular second messenger Leading investigators review a wide variety of studies on how calcium enters and moves through cells how it interacts with its many binding proteins and how calcium and its intracellular receptor calmodulin control vital cellular processes Coverage includes a detailed analysis of the mechanisms by which calcium bound to calmodulin regulates contractile proteins in smooth muscle cells Close attention is given to the roles of calcium and calmodulin dependent protein kinases and phosphatases in synaptic signal transduction protein synthesis gene expression programmed cell death activation of T lymphocytes and control of cell division cycles Other chapters discuss studies using genetically manipulable nonmammalian organisms to further probe the functions of calcium and calmodulin     *Molecular and Cellular Aspects of Muscle Contraction* Haruo Sugi, 2012-12-06 This volume presents the proceedings of a muscle symposium which was supported by the grant from the Fujihara Foundation of Science to be held as the Fourth Fujihara Seminar on October 28 November 1 2002 at Hakone Japan The Fujihara Seminar covers all fields of natural science while only one proposal is granted every year It is therefore a great honor for me to be able to organize this meeting Before this symposium I have organized muscle symposia five times and published the proceedings Cross bridge Mechanism in Muscle Contraction University of Tokyo Press 1978 Contractile Mechanisms in Muscle plenum 1984 Molecular Mechanisms of Muscle Contraction plenum 1988 Mechanism of Myofibril Sliding in Muscle contraction plenum 1993 Mechanisms of Work Production and Work Absorption in Muscle plenum 1998 As with these proceedings this volume contains records of discussions made not only after each presentation but also during the periods of General Discussion in order that general readers may properly evaluate each presentation and the up to date situation of this

research field It was my great pleasure to have Dr Hugh Huxley a principal discoverer of the sliding filament mechanism in muscle contraction in this meeting On my request Dr Huxley kindly gave a special lecture on his monumental discovery of myofibrillar lattice structure by X ray diffraction of living skeletal muscle I hope general readers to learn how a breakthrough in a specific research field can be achieved

**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

**Biochemistry of Smooth Muscle Contraction** Michael Barany, 1996-01-04 This valuable resource provides a systematic account of the biochemistry of smooth muscle contraction As a comprehensive guide to this rapidly growing area of research it covers the structure and characteristic properties of contractile and regulatory proteins with special emphasis on their predicted function in the live muscle Also included in this book are intermediate filament proteins and desmin and vimentin whose function in smooth muscle is unknown and several enzymes involved in the phosphorylation dephosphorylation of contractile and other proteins

**Molecular Mechanisms of Smooth Muscle Contraction** Kazuhiro Kohama, Yasuharu Sasaki, 1999 *Regulation and Contraction of Smooth Muscle* International Union of Physiological Sciences. Satellite Conference on Smooth Muscle Contraction, Marion J.

Siegmán, Andrew Paul Somlyó, Newman L. Stephens, International Union of Physiological Sciences. Congress, 1987

Medical Physiology Rodney A. Rhoades, David R. Bell, 2022-01-20 Delivering the most up to date information available in a rich engaging presentation Medical Physiology Principles for Clinical Medicine 6th Edition instills a complete understanding of physiology essential to effective clinical practice This robust text not only details how the human body reacts to internal and external changes but also provides a deep understanding of how physiologic systems coordinate to maintain optimal health as well as the involvement of altered functions in disease processes Extensively updated throughout and fully aligned

with today's medical curriculum the 6th Edition emphasizes the physiologic principles key to understanding human function places them in their fundamental context in clinical medicine and provides opportunities for student self directed and team based learning through case studies clinical application exercises and board style review questions

### **Cell Physiology**

**Source Book** Nicholas Sperelakis, Nick Sperelakis, 2001-08-02 This completely revised and updated source book provides comprehensive and authoritative coverage of cell physiology and membrane biophysics Intended primarily as a text for advanced undergraduate and graduate students and as a reference for researchers this multidisciplinary book includes several new chapters and is an invaluable aid to scientists interested in cell physiology biophysics cell biology electrophysiology and cell signaling **KEY FEATURES** Completely revised and updated includes 8 new chapters on such topics as membrane structure intracellular chloride regulation transport sensory receptors pressure effects and infrared detectors Includes broad coverage of both animal and plant cells Appendixes review basics of the propagation of action potentials electricity and cable properties Authored by leading experts in the field Clear concise comprehensive coverage of all aspects of cellular physiology from fundamental concepts to more advanced topics **PRAISE FOR THE SECOND EDITION** The authoritative volume in the field of cell physiology and certainly one of the most current sources of comprehensive information available **CHOICE** a core textbook in cell physiology The need for such a book is well justified and it fulfills its objectives admirably It is especially strong on the subjects of signal transduction membrane biology ion channels and neuronal and muscle cell physiology It is a solid textbook in its field **DOODY'S PUBLISHING REVIEWS** Cell Physiology Source Book 2e will be useful for advanced undergraduate and graduate students studying cell physiology cell biophysics electrophysiology and biological scientists in many fields The book is particularly suitable for introducing cell physiology to students with training in the physical sciences and for introducing cell biophysics to students with backgrounds in biology **BIOPHYSICAL JOURNAL** The Cell Physiology Source Book was on **CHOICE's** list of Outstanding Academic Books for 1996 and the second edition was on **CHOICE's** list of Outstanding Academic Books in 1998

### **Muscle Contraction** Clive R.

Bagshaw, 1993 Movement in living organisms is achieved by many different mechanisms of which muscle contraction is one of the most studied and best understood Nevertheless the precise details of muscle action at the molecular level are still being evaluated This book provides a concise account of our understanding to date [The Smooth Muscle of the Artery](#) Stewart Wolf, 2013-03-09 This volume contains the edited proceedings of a workshop conference **THE SMOOTH MUSCLE OF THE ARTERIAL WALL** held at Max Planck Haus Heidelberg West Germany on the occasion of the dedication of the new Myocardial Infarct Institute of the University of Heidelberg The conference was a sequel to one held three years earlier at Lindau West Germany on **THE ARTERY AND THE PROCESS OF ARTERIO SCLEROSIS** The earlier conference examined available data and conflicting theories on the pathogenesis of arteriosclerosis A major yield of this gathering was a consensus that smooth muscle cell proliferation in the sub endothelial space is a fundamental feature of atherogenesis It was therefore

decided in a second conference to bring together existing knowledge of arterial smooth muscle and of the structure and function of smooth muscle in general Accordingly an international and interdisciplinary group of experts were gathered together to assess current knowledge to attempt reconciliation of disparate data and synthesis of widely scattered information and to identify critical areas of ignorance As before the conference was conducted in the form of a dialogue with only a minimal number of formal presentations Grateful acknowledgement for financial support of the conference is extended to The Government of Baden Wurttemberg West Germany The Marine Biomedical Institute of the University of Texas Medical Branch Galveston Texas The Office of Naval Research Washington D C Biomedical Index to PHS-supported Research ,1991 Medical Physiology Rodney Rhoades,David R. Bell,2009 Now in its Third Edition this text clearly and concisely presents the physiological principles that are essential to clinical medicine Outstanding pedagogical features include Active Learning Objectives that emphasize problem solving applications of basic principles conceptual diagrams that help students visualize complex processes case studies Clinical Focus boxes and From Bench to Bedside boxes a comprehensive glossary and online USMLE style questions with answers and explanations This edition features a new Immunology and Organ Function chapter and a completely rewritten and reorganized cardiovascular section A companion Website will include the fully searchable text an interactive question bank case studies with practice questions animations of complex processes an image bank and links for further study **Male Sexual Dysfunction** Fouad R. Kandeel,2007-05-22 Although impotence may be the most widely recognized manifestation of male sexual dysfunction many other forms of sexual disorders do not involve the erectile mechanism from deficiencies of desire to disturbances in ejaculatory function to the failure of detumescence With such a myriad and often co existing number of disorders the successful tr **Cell Physiology** Nicholas Sperelakis,2013-10-22 A multi authored and comprehensive text Cell Physiology Source Book enables graduate students in various biological sub disciplines to gain a thorough understanding of cell physiology It begins with a review of the physical chemistry of solutions protein structure and membrane structure and ends with an Appendix featuring reviews of electricity electrochemistry and cable properties of cells In between this book is loaded with information on membrane potentials cell metabolism signal transduction transport physiology and pumps membrane excitability and ion channels synaptic transmission sensory transduction muscle contraction excitation contraction coupling bioluminescence photosynthesis and plant cell physiology This exhaustive work provides graduate students with detailed and authoritative coverage of nearly all aspects of cell physiology Such broad coverage of this field within a single source makes for a unique text Chapters written in a clear concise and didactic style and appropriate reviews of basic physics and chemistry are among the many distinguishing features of this monumental treatise Comprehensive source book of cell physiology Authoritative and multi authored by leading experts in the field Unique features include broad coverage and review of relevant physics chemistry and metabolism Clear concise and didactic Includes reviews of physical chemistry of solutions protein structure

membrane structure electrochemistry and electricity Topic covered include plant cell physiology photosynthesis bioluminescence effects of pressure cilia and flagellae Detailed treatise on ion channels and their regulation *Biomedical Index to PHS-supported Research: pt. A. Subject access A-H*, 1992

**Sliding Filament Mechanism in Muscle Contraction** Haruo Sugi, 2007-04-27 Sliding Filament Mechanism in Muscle Contraction Fifty Years of Research covers the history of the sliding filament mechanism in muscle contraction from its discovery in 1954 by H E Huxley through and including modern day research Chapters include topics in dynamic X ray diffraction electron microscopy muscle mechanisms in vitro motility assay cardiac versus smooth muscle motile systems and much more

**Asthma and Rhinitis** William W. Busse, Stephen T. Holgate, 2008-04-30 The second edition of this highly acclaimed text has been extensively revised and greatly expanded to reflect the considerable advances made in our understanding of the mechanisms of asthma and rhinitis Containing the contributions of 242 experts of international standing presented in 133 chapters Asthma and Rhinitis provides an up to date authoritative reference for both the clinician and scientist The global approach given in this book mirrors the universal approach to the understanding of allergic disease The editors have carried out a thorough and radical revision of the content by adding 6 new sections and 44 new chapters Most of this expansion is due to greatly increased coverage of the clinical aspects of asthma with new sections on childhood asthma and on drug treatment each drug class has its own chapter Also the expansion of research into the genetic basis of asthma has necessitated a whole new section on Genetics comprising some six chapters There are also new chapters on adult onset asthma and the relationship of asthma to sinusitis A new section on Asthma in Special Circumstances includes chapters on asthma in pregnancy asthma and surgery asthma in the elderly and asthma in the context of critical care In bringing the Second Edition fully up to date the book has inevitably increased in size and is now presented in two volumes The second edition of Asthma and Rhinitis will continue the tradition of its predecessor of providing an up to the minute reference for all those involved in the management of and research into asthma and rhinitis

**Calcium in Muscle Contraction** Johann C. Rüegg, 2012-12-06 Recent years have witnessed an explosion of knowledge leading to a molecular understanding of the mechanisms of action of calcium on excitation and contraction coupling and its role in the regulation of contractility This book highlights the most recent progress as well as providing a historical perspective of the field It presents a concise and comprehensive overview of our current knowledge regarding calcium channels and regulatory proteins as well as intracellular calcium handling and the mechanisms underlying the activation of contractile proteins It also describes how these basic mechanisms have been adapted in various types of muscle especially in cardiac and smooth muscle

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