

Muscle Contraction

ACSC009: Cellular Physiology & Pharmacology (2020)
Lect 10: Muscle

Background

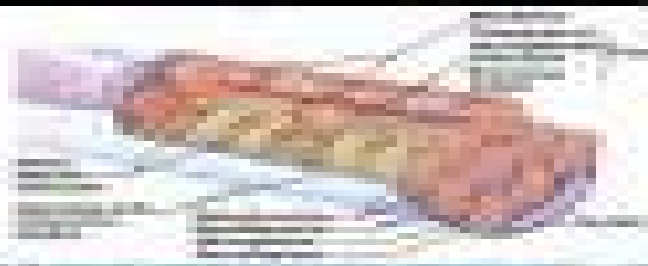
Excitation-contraction coupling

Muscle cells are specialised to produce lots of contractile proteins. It is possible to stimulate a muscle cell with an electrical stimulus. This will generate an action potential which travels down the sarcolemma. The sarcolemma is the cell membrane, and the myofibrils are contained in the sarcomeres. The sarcomeres are the basic contractile units of the muscle. They are made up of actin and myosin filaments. The sarcomeres are the basic contractile units of the muscle. They are made up of actin and myosin filaments. The sarcomeres are the basic contractile units of the muscle. They are made up of actin and myosin filaments.

Diagram

Pre-contraction

Post-contraction



Three stages: Latent

Latent is the time between the start of the contraction and the start of the relaxation. It is the time when the muscle is not yet fully contracted. It is the time when the muscle is not yet fully contracted. It is the time when the muscle is not yet fully contracted. It is the time when the muscle is not yet fully contracted.

Excitation-contraction coupling

A muscle contraction is a complicated system and can differ according to the type of muscle and the type of muscle tissue. The following table describes the different types of muscle and the different types of muscle tissue.

Diagram of the Excitation-contraction coupling

1	The action potential travels down the sarcolemma and into the T-tubules.	
2	The T-tubules contain voltage-sensitive proteins that activate a calcium-release channel, which releases calcium from the sarcoplasmic reticulum.	
3	The released calcium binds to troponin, which causes the myosin heads to bind to the actin filaments.	
4	The myosin heads pull the actin filaments towards the center of the sarcomere, causing contraction.	

Muscle Contraction Haspi Medical Anatomy And Physiology 09b Answers

Robert S Moreland



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Molecular and Cellular Aspects of Muscle Contraction Haruo Sugi, 2003 This volume presents the proceedings of a muscle symposium which was held as the Fourth Fujihara seminar on October 28 November 1 2002 at Hakone Japan This volume covers all fields of muscle biology from molecules to humans This book provides information about recent progress of muscle research as well as the problems that remain to be investigated This volume will stimulate muscle investigators to design and perform novel experiments to clarify the mysteries in muscle contraction 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 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 **Muscle Contraction and Cell Motility** Haruo

Sugi, 2016-11-03 This book provides a comprehensive overview of the current progress in muscle contraction and cell motility research It discusses structural mechanical and biochemical characteristics of skeletal cardiac and smooth muscles and cell motility The experimental objects of the studies described in this volume extend from humans to molecules A distinct feature of this volume is that in some chapters evidence against the textbook view is presented showing how well established dogma can be denied by an unexpected discovery This book is as interesting as it is informative for general readers and young scientists alike and it is sure to inspire both to challenge the enticing mysteries that still remain in this exciting research field

Muscle Contraction Clive R. Bagshaw, 1982-10-21 The student of biological science in his final years as an undergraduate and his first years as a graduate is expected to gain some familiarity with current research at the frontiers of his discipline New research work is published in a perplexing diversity of publications and is inevitably concerned with the minutiae of the subject The sheer number of research journals and papers also causes confusion and difficulties of assimilation Review articles usually presuppose a background knowledge of the field and are inevitably rather restricted in

scope There is thus a need for short but authoritative introductions to those areas of modern biological research which are either not dealt with in standard introductory textbooks or are not dealt with in sufficient detail to enable the student to go on from them to read scholarly reviews with profit This series of books is designed to satisfy this need The authors have been asked to produce a brief outline of their subject assuming that their readers will have read and remembered much of a standard introductory textbook of biology This outline then sets out to provide by building on this basis the conceptual framework within which modern research work is progressing and aims to give the reader an indication of the problems both conceptual and practical which must be overcome if progress is to be maintained *Regulation of Smooth Muscle*

Contraction Robert S Moreland, 1992-01-31

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