

Algal Cell Motility

Current Phycology 3

***Edited by
Michael Melkonian***

Algal Cell Motility

Michael Melkonian



Algal Cell Motility:

Algal Cell Motility Michael Melkonian, 2012-12-06 Algae exhibit the greatest variety of cell motility phenomena in the living world. These range from the peculiar gliding motility of filamentous blue green algae or cyanobacteria to chloroplast movements and cytoplasmic streaming which are most common in higher plants. In addition, cell motility by eukaryotic flagella is the characteristic mode of cell locomotion in algal flagellates and most reproductive cells of algae. Algae use these cell motility systems mainly to orient themselves or their photosynthetic organelles in a suitable light gradient to optimize growth and reproduction. In consequence, most of the motility systems are coupled to photoreceptors and are regulated by signal transduction cascades. Algal cell motility has thus attracted considerable interest also from non phycologists and some algal motility systems have become models of research in cell and molecular biology. This book summarizes some of the progress that has been made in recent years in the analysis of cell motility phenomena in the algae. Although complete coverage of the subject was not attempted, the six chapters cover all the major types of cell motility systems and the authors provide in depth reviews of gliding motility, chloroplast movements, cytoplasmic streaming, flagellar beat patterns, mechanisms of flagellar movement and centriole mediated cell motility. *Algal Cell Motility* Michael Melkonian, 1991-12-05

The Chlamydomonas Sourcebook: Cell Motility and Behavior George Witman, 2009-03-07 This volume reviews virtually everything that is known about cell motility and behavior in *Chlamydomonas*. World experts in each area focus on mitosis and cytokinesis, flagellar assembly and motility, intraflagellar transport and more. It will use this reference as a guide for understanding human diseases of the cilium. The volume is richly illustrated and is supplemented by a Website containing both classic and previously unpublished videos of cell motility in *Chlamydomonas*. Because *Chlamydomonas* has been the premier model for investigating the function and behavior of cilia and flagella, the chapters summarize the current state of knowledge in these areas as it applies to all ciliated organisms. Thus, this volume will be an essential source for all students and researchers interested in cell motility. This volume is part of a 3 Volume Set ISBN 978 0 12 370873 1 and is also sold individually. Includes a table listing the known proteins with NCBI accession numbers for each structure discussed and the known mutations that affect each structure and process. Essential reference to a model species for the study of mechanisms of motility in free living cells. Includes methods for *Chlamydomonas* motility research. Companion Website with videos illustrates the marvels of the *Chlamydomonas* flagella in action. **Muscle Contraction and Cell Motility** H.

Sugi, 2012-12-06 This volume intends to provide a comprehensive overview on the mechanisms of muscle contraction and non muscle cell motility at the molecular and cellular level, not only for investigators in these fields but also for general readers interested in these topics. A most attractive feature of various living organisms in the animal and plant kingdoms is their ability to move. In spite of a great diversity in the structure and function of various motile systems, it has frequently been assumed since the nineteenth century that all kinds of motility are essentially the same. Based on this assumption, some

investigators in the nineteenth century thought that the mechanisms of motility could better be studied on primitive non muscle motile systems such as amoeboid movement rather than on highly specialized muscle cells. Contrary to their expectation however the basic mechanisms of motility have been revealed solely by investigations on vertebrate skeletal muscles since a monumental discovery of Szent Gyorgyi and his coworkers in the early 1940s that muscle contraction results from the interaction between two different contractile proteins actin and myosin coupled with ATP hydrolysis.

The Cytoskeleton of Flagellate and Ciliate Protists Michael Melkonian, Robert A. Andersen, Eberhard Schnepf, 2012-12-06 This is a new type of calculus book. Students who master this text will be well versed in calculus and in addition possess a useful working knowledge of how to use modern symbolic mathematics software systems for solving problems in calculus. This will equip them with the mathematical competence they need for science and engineering and the competitive workplace. MACSYMA is used as the software in which the example programs and calculations are given. However by the experience gained in this book the student will also be able to use any of the other major mathematical software systems like for example AXIOM, MATHEMATICA, MAPLE, DERIVE or REDUCE for doing calculus on computers.

The Cytoskeleton of the Algae Diedrik Menzel, 2024-12-20 The Cytoskeleton of the Algae provides a comprehensive examination of the structural features of the cytoskeleton in phylogenetic branches of algae. The book also analyzes the possible functions of cytoskeletal components using structural, physiological, genetic and molecular approaches. Many taxa are described in detail mirroring the dramatic progress that has been made in recent years in this new research field. Many unique structural elements and motility phenomena are described for the first time and other features common to all plant cells such as cell polarity, cytoplasmic streaming, mitosis, cell wall deposition and contractile events are analyzed using algae as experimental model systems. The Cytoskeleton of the Algae reflects the enormous impact that research on the algal cytoskeleton has on both phycology and plant cell biology and it will serve as an excellent reference volume for researchers in this area.

Diatom Gliding Motility Stanley A. Cohn, Kalina M. Manoylov, Richard Gordon, 2021-09-08 DIATOM GLIDING MOTILITY Moving photosynthetic organisms are still a great mystery for biologists and this book summarizes what is known and reports the current understanding and modeling of those complex processes. The book covers a broad range of work describing our current state of understanding on the topic including historic knowledge and misconceptions of motility, evolution of diatom motility, diatom ecology, cell biology and biochemistry of diatom motility, anatomy of motile diatoms, observations of diatom motile behavior, diatom competitive ability, unique forms of diatom motility as found in the genus *Eunotia* and models of motility. This is the first book attempting to gather such information surrounding diatom motility into one volume focusing on this single topic. Readers will be able to gather both the current state of understanding on the potential mechanisms and ecological regulators of motility as well as possible models and approaches used to help determine how diatoms accomplish such varied behaviors as diurnal movements, accumulation into areas of light, niche partitioning to increase species success. Given the fact that

diatoms remain one of the most ecologically crucial cells in aquatic ecosystems we hope that this volume will act as a springboard towards future research into diatom motility and even better resolution of some of the issues in motility

Audience Diatomists phycologists aquatic ecologists cellular physiologists environmental biologists biophysicists diatom nanotechnologists algal ecologists taxonomists Environmental Pollution Control Microbiology Ross E. McKinney, 2004-03-11 Compiling knowledge gained through more than 50 years of experience in environmental engineering technology this book illustrates the application of fundamental concepts in microbiology to provide a sound basis for the design and operation of various biological systems used in solving environmental challenges in the air water and soil

Environme *Progress in Botanical Research* Ioannes Tsekos, Michael Moustakas, 2012-12-06 This volume is the final document of the 1st Balkan Botanical Congress and comprises after reviewing the full texts of the Congress Lectures submitted by their authors The articles refer to all branches of plant sciences in the field of pure and applied research The subjects dealt with in the Congress and each representing a separate section in this book covered the following areas of interest I Taxonomy geobotany and evolution II Biochemistry metabolism and bioenergetics III Ecology and ecophysiology IV Structure and its dynamics V Genetics plant breeding and biotechnology VI Growth development and differentiation The Congress was organized by the Department of Botany Aristotle University of Thessaloniki and the Hellenic Botanical Society The city of Thessaloniki was chosen by the Organizers since it enjoyed the accolade of the cultural capital of Europe for the year 1997 The Thessaloniki Congress has taken on the character of an International Congress since 320 scientists mainly from the Balkan countries and the rest of Europe 26 countries in all took part in it The 11 invited speakers who shared their experience with us were well known specialists from all the European countries **International Review of Cytology** , 1999-04-19 International Review of Cytology presents current advances and comprehensive reviews in cell biology both plant and animal Articles address structure and control of gene expression nucleocytoplasmic interactions control of cell development and differentiation and cell transformation and growth Authored by some of the foremost scientists in the field each volume provides up to date information and directions for future research Key Features Differentiation Related Changes in the Cell Cycle Nitric Oxide and Endothelin 1 in Coronary and Pulmonary Circulation Phosphoinositide Kinases in Higher Plant Cells Chlamydomonas Cell Cycle Mutants Cellular Aspects of Trophic Actions in the Nervous System Conformational Changes of Muscle Contractile Proteins International Review of Cell and Molecular Biology Kwang W. Jeon, 2011-09-02 International Review of Cell Molecular Biology presents current advances and comprehensive reviews in cell biology both plant and animal Authored by some of the foremost scientists in the field each volume provides up to date information and directions for future research Articles in this volume include Transgenic Mouse Models in Angiogenesis and Lymphangiogenesis Morphogenesis in Giant celled Algae Plasmodium in the Post Genomic Era New Insight into the Molecular Cell Biology of Malaria Parasites Role of Nuclear Lamins in Nuclear Organization Cellular Signalling and Inherited

Diseases New Insights into the Mechanisms of Macroautophagy in Mammalian Cells Covers the latest on transgenic mouse models in angiogenesis and lymphangiogenesis Includes information on morphogenesis in giant celled algae Provides new insights into the mechanisms of macroautophagy in mammalian cells Actin: A Dynamic Framework for Multiple Plant Cell Functions Christopher J. Staiger, Frantisek Baluska, D. Volkmann, P. Barlow, 2013-04-17 Actin is an extremely abundant protein that comprises a dynamic polymeric network present in all eukaryotic cells known as the actin cytoskeleton The structure and function of the actin cytoskeleton which is modulated by a plethora of actin binding proteins performs a diverse range of cellular roles Well documented functions for actin include providing the molecular tracks for cytoplasmic streaming and organelle movements formation of tethers that guide the cell plate to the division site during cytokinesis creation of honeycomb like arrays that enmesh and immobilize plastids in unique subcellular patterns supporting the vesicle traffic and cytoplasmic organization essential for the directional secretory mechanism that underpins tip growth of certain cells and coordinating the elaborate cytoplasmic responses to extra and intracellular signals The previous two decades have witnessed an immense accumulation of data relating to the cellular biochemical and molecular aspects of all these fundamental cellular processes This prompted the editors to put together a diverse collection of topics contributed by established international experts related to the plant actin cytoskeleton Because the actin cytoskeleton impinges on a multitude of processes critical for plant growth and development as well as for responses to the environment the book will be invaluable to any researcher from the advanced undergraduate to the senior investigator who is interested in these areas of plant cell biology **The Algae World** Dinabandhu Sahoo, Joseph Seckbach, 2015-12-16 Algal World has been carefully written and edited with an interdisciplinary appeal and aims to bring all aspects of Algae together in one volume The 22 chapters are divided into two different parts which have been authored by eminent researchers from across the world The first part Biology of Algae contains 10 chapters dealing with the general characteristics classification and description of different groups such as Blue Green Algae Green Algae Brown Algae Red Algae Diatoms Xanthophyceae Dinophyceae etc In it has two important chapters covering Algae in Extreme Environments and Life Histories and Growth Forms in Green Algae The second part Applied Phycology contains 12 chapters dealing with the more applied aspects ranging from Algal Biotechnology Biofuel Phycoremediation Bioactive Compounds Biofertilizer Fatty Acids Harmful Algal Blooms Industrial Applications of Seaweeds Nanotechnology Phylogenomics and Algal culture Techniques etc *Stream Ecology* J. David Allan, María M. Castillo, Krista A. Capps, 2021-03-17 Stream Ecology Structure and Function of Running Waters is designed to serve as a textbook for advanced undergraduate and graduate students and as a reference source for specialists in stream ecology and related fields This Third Edition is thoroughly updated and expanded to incorporate significant advances in our understanding of environmental factors biological interactions and ecosystem processes and how these vary with hydrological geomorphological and landscape setting The broad diversity of running waters from torrential mountain brooks to large

lowland rivers to great river systems whose basins occupy sub continents makes river ecosystems appear overwhelming complex A central theme of this book is that although the settings are often unique the processes at work in running waters are general and increasingly well understood Even as our scientific understanding of stream ecosystems rapidly advances the pressures arising from diverse human activities continue to threaten the health of rivers worldwide This book presents vital new findings concerning human impacts and the advances in pollution control flow management restoration and conservation planning that point to practical solutions Reviews of the first edition an unusually lucid and judicious reassessment of the state of stream ecology Science Magazine provides an excellent introduction to the area for advanced undergraduates and graduate students Limnology Oceanography a valuable reference for all those interested in the ecology of running waters Transactions of the American Fisheries Society Reviews of the second edition Overall a must for the field centre and a good starter text in stream ecology TEN News October 2007 Highly recommended Upper division undergraduates through faculty P R Pinet CHOICE Vol 45 7 2008 a very good fluidly readable book which contains the latest key scientific knowledge of the ecology of running waters Daniel Graeber International Review of Hydrobiology Vol 94 2 2009

Photomovement D.-P. Häder,M. Lebert,2001-06-19 This volume emphasizes the involvement of all facets of biology in the analysis of environmentally controlled movement responses This includes biophysics biochemistry molecular biology and as an integral part of any approach to a closer understanding physiology The initial euphoria about molecular biology as the final solution for any problem has dwindled and the field agrees now that only the combined efforts of all facets of biology will at some day answer the question posed more than hundred years ago How can plants see One conclusion can be drawn from the current knowledge as summarized in this volume The answer will most likely not be the same for all systems

Flagellates Barry S. C. Leadbeater,John C. Green,2002-09-11 The Flagellates presents a multidisciplinary view of the flagellates exploring both their unity in terms of their structure mechanisms and processes and their diversity in terms of biogeography niche colonisation and adaptations to their environment In addition evolutionary relationships amongst flagellates are explored This is the only book published on this subject and features the most up to date information available making it an essential read for any one interested in or working in this field

Subject Index of Current Research Grants and Contracts Administered by the National Institute of General Medical Sciences National Institute of General Medical Sciences (U.S.),1975

Cell Motility Howard Stebbings,Jeremy S. Hyams,1979

Progress in Botany / Fortschritte der Botanik H.-Dietmar Behnke,Ulrich Lüttge,Karl Esser,Joachim W. Kadereit,Michael Runge,2012-12-06 With one new volume each year this series keeps scientists and advanced students informed of the latest developments and results in all areas of botany The present volume includes reviews on plant physiology genetics taxonomy and geobotany

Biology of Algae, Lichens and Bryophytes Burkhard Büdel,Thomas Friedl,Wolfram Beyschlag,2024-03-06 As a reader of this book you will become familiar with current up to date comprehensive knowledge

about all classes of eukaryotic algae the cyanobacteria and symbiotic interactions of algae and cyanobacteria with other organisms For example the lichens are symbiotic consortia and a prominent example of a particularly successful evolution by cooperation We expand even to the beginnings of terrestrial plant life and the bryophytes which are gradually transmitting to the vascular plants We collectively call this enormous phylogenetic wealth of photoautotrophic organisms the new cryptogams abandoning the traditional definition of cryptogams The new cryptogams are all those autotrophic organisms that share being hydro passive meaning that they are unable of controlling water uptake or release in contrast to vascular plants While being basal of and phylogenetically much more diverse than the vascular plants the new cryptogams are ecologically highly relevant in all ecosystems of our Planet They are responsible for more than half of the Earth s annual oxygen production

Whispering the Strategies of Language: An Psychological Quest through **Algal Cell Motility**

In a digitally-driven world wherever displays reign great and quick transmission drowns out the subtleties of language, the profound secrets and psychological subtleties concealed within words usually go unheard. However, located within the pages of **Algal Cell Motility** a fascinating literary value sporting with raw feelings, lies a fantastic journey waiting to be undertaken. Penned by a talented wordsmith, this wonderful opus encourages viewers on an introspective trip, gently unraveling the veiled truths and profound affect resonating within ab muscles cloth of each and every word. Within the mental depths of this poignant review, we shall embark upon a genuine exploration of the book is core themes, dissect its charming publishing design, and succumb to the strong resonance it evokes serious within the recesses of readers hearts.

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