

Results and Problems
in Cell Differentiation
Volume 2

Origin and Continuity of Cell Organelles

Edited by
J. Reinert and H. Ursprung



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Origin And Continuity Of Cell Organelles

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Origin And Continuity Of Cell Organelles:

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Continuity of Cell Organelles J. Reinert, H. Ursprung, 2014-04-18 The first volume of the series on The Stability of the Differentiated State received many favorable reviews from the scientific community Many readers seem to agree with us that publication of topical volumes is a worthwhile alternative to periodic compilations of rather unrelated though up to date reviews Production of topical volumes is however plagued with one great difficulty that of author synchronization This difficulty explains the lag between volumes 1 and 2 of the series Nevertheless we hope that the present volume will be appreciated as a valuable source of information on its central topic How do cell organelles originate and what mechanisms assure their continuity T bingen Berlin Z rich V BEERMANN J REINERT H URSPRUNG Heidelberg H W HA GENS Contents Assembly Continuity and Exchanges in Certain Cytoplasmic Membrane Systems by W GORDON WHALEY MARIANNE DAUWALDER a d OYCE E KEPHART 1 I The Nature of the Membrane H The Assembly of Membranes 5 III The Growth and Transfer of Membranes 6 A The Nuclear Envelopc 6 B The Endoplasmic Reticulum 13 C The Golgi Apparatus 17 D The Plasma Membrane 28 E Vacuoles and Vesicles 31 IV Concluding Remarks 37 References 38 Origin and Continuity of Mitochondria by ROBERT BAXTER 1 Introduction 46 H Mitochondrial Biogenesis thc Machincry 46 III Limitations of Mitochondrial Autonomy 50 IV The Replication of Mitochondria 53 V Discussion and Conclusion 58 Referenccs 59 Origin and Continuity of Plastids by VILFRIED STUBBE 1 Introduction 65 II Arguments for the Continuity of Plastids **Origin and**

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Reinert, Heinrich Ursprung, 1971 *Endosymbiotic Theories of Organelles Revisited* Naoki Sato, 2020-01-03 This book re-examines the endosymbiotic theory and presents various related theories and hypotheses since the first proposal in 1905 by a Russian biologist. It also demonstrates that Lynn Margulis's contribution to the current endosymbiotic is less than sometimes thought and presents a plausible idea on how the organelles were formed. Explaining that Margulis's initial work did not intend to show the endosymbiotic origin of chloroplasts and mitochondria, the book discusses their endosymbiotic origin in the light of current biology with the help of clear visual images. Further, by including numerous historical facts and details of phylogenetic analyses using recent genomic data that are largely unknown to many in the field, it offers deep insights into the history of biology, phylogenetic analysis, and the new evolutionary thinking. 2017 was the 50-year anniversary of Margulis's first paper in the *Journal of Theoretical Biology* and 2020 will mark 50 years since the publication of her famous work *Origin of Eukaryotic Cells* and as such this book offers a timely reconsideration of the works of Lynn Margulis and the endosymbiotic origin of organelles.

Biochemistry and Structure of Cell Organelles Robert A. Reid, 2013-06-29 THIS BOOK HAS BEEN WRITTEN BECAUSE WE FEEL THAT THERE IS A NEED FOR AN up to date compact book on cell organelles that transmits the excitement and challenge of modern subcellular biology. We hope that the book will be interesting and useful to students of the biological sciences and medicine and to those in the teaching professions who do not have ready access to research papers. Since space is at a premium we have denied ourselves the luxury of a philosophical discussion of the problems of defining organelles. Rather we have chosen to include all those intracellular structures which have limiting membranes and definable compartments. The separate chapters consider nuclei, plastids, mitochondria, microbodies, endoplasmic and sarcoplasmic reticulum, Golgi bodies, lysosomes, and various secretory vesicles including chromaffin granules and synaptic vesicles. Nucleoli, ribosomes, and centrioles are included in the chapter on nuclei. New and exciting information about all these structures has emerged in recent years; for example, the nucleosome interrupted genes, signal sequences on proteins destined for the bioenergetic organelles, mapping and sequencing of organelle genes, and consolidation of chemiosmosis as a unifying principle in energy transduction. We have outlined as many of these developments as possible and pointed out some areas of controversy. The literature on subcellular biology is so extensive that it would have been easier to have written a separate book on each organelle.

Membrane Research: Classic Origins and Current Concepts A. L. Muggleton-Harris, 2013-10-15 *Membrane Research: Classic Origins and Current Concepts* is a special volume of the *International Review of Cytology* dedicated to Dr Danielli on the occasion of his retirement from official duties. The central theme of the volume is membranes. The diversity of topics ranges from the biogenesis of membranes and their components to the use of optical and lectin probes as a means to study the structure, physiology, and interactions of cell components and organelles in plant and animal systems. The book begins with a study on the cell surface of the mammalian embryo and the events associated with the formation of the differentiated blastocyst. This is followed by separate chapters on the structural

associations between the inner and outer bacterial membrane the interactions of cell wall and membrane in plant cells the morphological and functional aspects of membranes and methods for studying the physiology of cell and organelles at the membrane level Subsequent chapters deal with the synthesis of cellular proteins and glycoproteins techniques for fixing and preserving the ultrastructure of the membrane the synthesis of artificial organelles and the effects of drugs and chemicals on membrane transport utilizing kidney tissue and vesicles This book provides an outstanding reference source for all scientific researchers and teachers

Stems Cells and Tissue Homeostasis Brian Iles Lord, 1978-07-20 *Nucleic Acids and Proteins in Plants II* Benno Parthier, Donald Boulter, 2012-12-06 With contributions by numerous experts

The Structure and Function of Skin William Montagna, 2012-12-02 The Structure and Function of Skin Third Edition is devoted to all matters pertaining to the structure and function of the skin Drawing upon the accumulated data derived from embryology histology anatomy physiology biochemistry and pharmacology this book presents an overview of skin with emphasis on human skin Topics range from the biological functions of the dermis to the histochemical and microchemical properties of the epidermis the effects of protein deficiency on hair growth cutaneous innervation nail regeneration and growth sebaceous glands and eccrine sweat glands This book is organized into 12 chapters and begins with an overview of the structure and function of skin and then discusses the epidermis and its structural features Special consideration is given to the life cycle of epidermal cells the properties and function of stratum corneum and other cells in the epidermis including melanocytes the cells of Langerhans and Merkel cells The chapters that follow focus on age related changes in the dermis cutaneous blood flow changes in skin circulation and the dermal nerve network The book also considers hair growth and differentiation the effects of malnutrition on the morphology of hair roots and the structure and development of the nails A chapter describing the cytochemistry and pharmacology of eccrine sweat glands concludes the book This book is written primarily for dermatologists whether seasoned veterans or neophytes and will also be useful to all biologists who are interested in biomedical disciplines

Comparative Organellography of the Cytoplasm Albert Frey-Wyssling, 2012-12-06 Since the publication of my monograph *Die submikroskopische Struktur des Cytoplasm as Protoplasmatologia III A12* 1955 science has increased our knowledge on this cell constituent in an amazing way At that time cytoplasm was still considered as an amorphous colloid with an amicroscopic structure capable of sol gel transformations Meanwhile within the past 18 years ultrastructure research and molecular biology have shown that it consists of structured organelles thereby revolutionizing our concept of the cytoplasm There is an ontogeny of these organelles which deals with their appearance development growth and eventual disappearance Although the results of relevant studies are less spectacular at this time than those concerning nucleic acids they will become more and more important in the near future because they touch the basic question of how molecular morphogenesis is realized Therefore an attempt is made to portray the actual state of these problems from a biological point of view which involves a comparison of the established organelles I thank Miss SONIA TURLER and Dr

ELSA HAUSERMANN for their help with the manuscript and my former pupils and assistants Drs Kopp KUHN SCHWARZENBACH STAEHELIN STEINMANN and VOGEL as well as my colleagues Professors MATILE Moor and MUHLETHALER for original electron micro graphs *The Cell Surface in Development and Cancer* Malcolm S. Steinberg, 2013-06-29 This series was established to create comprehensive treatises on specific topics in developmental biology Such volumes serve a useful role in developmental biology since it is a very diverse field that receives contributions from a wide variety of disciplines This series is a meeting ground for the various practitioners of this science facilitating an integration of heterogeneous information on specific topics Each volume is intended to provide the conceptual basis for a comprehensive understanding of its topic as well as an analysis of the key experiments upon which that understanding is based The specialist in any aspect of developmental biology should understand the experimental background of the field and be able to place that body of information in context to ascertain where additional research would be fruitful At that point the creative process generates new experiments This series is intended to be a vital link in that ongoing process of learning and discovery **Algal Physiology and Biochemistry** William Duncan Patterson Stewart, 1974 Current Topics in Membranes and Transport, 1978-10-23 Current Topics in Membranes and Transport **Research Grants Index** National Institutes of Health (U.S.). Division of Research Grants, 1975 *Oocyte Growth and Maturation* T.A. Dettlaff, Sergei G. Vassetzky, 2012-12-06 Studies of oogenesis occupy an important place in current investigations in developmental biology Today no one has any doubt whatsoever that oogenesis is not just the prelude to development but is development itself and a very essential part of it These words of an eminent Soviet scientist B L As taurov taken by T B Aizenshtadt as an epigraph to her chapter in this book make a good epigraph for the entire book It is now clear that during oogenesis not only vast reserves of ribosomes and mitochondria of yolk carbohydrates and lipids and of enzymes for protein and nucleic acid synthesis and for carbohydrate and fat metabolism which ensures the energy supply and metabolism of the oocyte and the developing embryo are formed but also long lived mRNA and proteins are synthesized which determine both the completion of oocyte maturation and the initial stages of embryonic development In the last 15-20 years the use of molecular biology methods electron microscopy autoradiography and microsurgical methods of experimental embryology in studying the pre embryonic development of animals has greatly increased our knowledge of oogenesis This has led to the need to systematize the data obtained to reinterpret old ideas and to review the results obtained by new research trends which have emerged in the last few years and which are of general biological interest Such a task was undertaken in the book *Sovremennye Problemy Oogeneza* Current Problems of Oogenesis published in 1977 in Russian Research Awards Index, *Patterns of Chloroplast Reproduction* T. Butterfass, 2012-12-06 The subject of this book has not been treated comprehensively before For many years I have hesitated to attempt a monographic presentation because I felt uneasy about the idea of delineating something I am not sure about myself and I felt it might be rash to try to integrate what seemed and largely still seems to

consist of a heap of tessera not fitting together The conviction won over however that the many details accumulated thus far call for some order now and that an appraisal of where we stand would be appropriate This book I hope can fill a gap barring the way to further progress in the field It is not only a compilation of details but also an attempt to delineate the first outlines of a picture blurry obscure and controversial as it must appear The imagination of the research worker will be aroused I hope and stimulate further progress In addition to data widely dispersed in the literature much unpublished material has been included The limited space available prevented me from giving all the details known The subject is also linked to many neighboring fields of study but these relationships and their ramifications could not be discussed at length This is a minor shortcoming however compared with our great ignorance of the subject in general

Cytomorphogenesis in Plants

Oswald Kiermayer, 2012-12-06 In 1958 E BUNNING published a book in the former series Proto plasmatologia entitled Polarität und ungleiche Teilung des pflanzlichen Protoplasten polarity and unequal division of the plant protoplast in which for the first time results of experimental plant cytomorphogenesis were reviewed This book was based completely on light microscopic observations and rather simple experimental techniques Since then our knowledge of basic cytomorphogenetic mechanisms has greatly increased especially with the introduction of modern ultrastructural biochemical and sophisticated experimental methods so that the field of cytomorphogenesis in our days should be considered a separate discipline within the general field of cell biology This book Cytomorphogenesis in Plants represents a necessary attempt to bring together current knowledge in this field of research on a comparable basis Unfortunately enormous gaps in our understanding of the underlying principles of cytomorphogenetic events still exist Therefore it seemed reasonable to present a book composed of individual chapters each written by experts for a defined experimental system Each chapter represents a separate treatise with its own references hence it was not possible to avoid some overlap both in the text and in the literature of the chapters without destroying the uniformity of the respective article

Biology of the Microsporidia Lee A. Bulla, Thomas C.

Cheng, 2013-11-11 This is the introductory volume of a new series to be issued under our general editorship With the development of an unprecedented increase in interest in comparative pathobiology we are of the opinion and intent that Comparative PathobioZogy should become the focal point for the publication of definitive reviews and the proceedings of significant symposia in this area of modern biomedical science Although the term is now in common use the question is still sometimes raised as to what pathobiology includes This broad area of modern biology includes but extends beyond traditional pathology It also encompasses studies directed at understanding the biology chemistry and physics of infectious agents including how they contact and invade the affected organism the reactions of hosts to such agents as well as to abiotic invaders the ecologic parameters which facilitate infection and the development of tools essential for the understanding of host pathogen interactions In other words pathobiology is interdisciplinary and incorporates all of those aspects of biology chemistry and physics which directly or indirectly permit greater understanding of the nature of infectious

and noninfectious diseases and the possible implications of such in biomedicine agriculture and environmental science By comparative is meant an analytical and critical evaluation of comparable processes as they apply to all categories of animals invertebrates as well as poikilothermic and homeothermic vertebrates

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