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The Song of the Cell Molecular Biology of The Cell The Lives of a Cell Physical Biology of the Cell Mechanics of the Cell The Cell: A Very Short Introduction Molecular Biology of the Cell 6E - The Problems Book The Cell Signature in the Cell Cell Biology by the Numbers The Cell The Tale of The Cell The Biology of the Cell Surface Ubiquitin and the Biology of the Cell Concepts of Biology Molecular Biology of the Cell Cell Biology E-Book Water and the Cell The Cell in Mitosis Cell-Cell Channels Micrographia The Basics of Cell Biology The Cell as A Machine Story of the Cell Inside the Cell In Search of Cell History Single-Cell-Based Models in Biology and Medicine The Dictionary of Cell and Molecular Biology Life Anatomy and Physiology The Cell Biology of Stem Cells The Biology of Cell Reproduction The Cell Cycle Cells: Molecules and Mechanisms Cell Biology Cell Movements Elastic Filaments of the Cell Concepts in Cell Biology - History and Evolution Crossing the Boundaries of Life Atlas of Living Cell Cultures

"The difficulty of reconciling chemical mechanisms with the functions of whole living systems has plagued biologists since the development of cell theory in the nineteenth century. As Karl Matlin argues in Crossing the Boundaries of Life, it is no coincidence that this longstanding knot of scientific inquiry was loosened most meaningfully by the work of a cytologist, the Nobel

laureate Günter Blobel. In 1975, using an experimental setup that did not contain any cells at all, Blobel was able to synthesize proteins to theorize how proteins in the cell communicate spatially, an idea he called signal hypothesis. Over the next 20 years, Blobel and other scientists were able to dissect this process into its precise molecular details. For elaborating his signal concept into a process he termed membrane topogenesis-the idea that each protein in the cell is synthesized with an "address" that directs the protein to its correct destination within the cell-Blobel was awarded the Nobel Prize in Physiology or Medicine in 1999. Matlin argues that Blobel's investigative strategy and its subsequent application addressed the fundamental unresolved dilemma that had bedeviled biology from its very beginning, allowing biology to overcome the barrier that had long blocked progress toward mechanistic explanations of life. Crossing the Boundaries of Life thus uses Blobel's research and life story to shed light on the importance of cell biology for twentieth-century science, illustrating how it propelled the development of adjacent disciplines like biochemistry and molecular biology"-- The Cell Cycle: Principles of Control provides an engaging insight into the process of cell division, bringing to the student a much-needed synthesis of a subject entering a period of unprecedented growth as an understanding of the molecular mechanisms underlying cell division are revealed. This book discusses central concepts and theories in cell biology from the ancient past to the 21st century, based on the premise that understanding the works of scientists like Hooke, Hofmeister, Caspary, Strasburger, Sachs, Schleiden, Schwann, Mendel, Nemec, McClintock, etc. in the context of the latest advances in plant cell biology will help provide valuable new insights. Plants have been an object of study since the roots of the Greek, Chinese and Indian cultures.

Since the term “cell” was first coined by Robert Hooke, 350 years ago in Micrographia, the study of plant cell biology has moved ahead at a tremendous pace. The field of cell biology owes its genesis to physics, which through microscopy has been a vital source for piquing scientists’ interest in the biology of the cell. Today, with the technical advances we have made in the field of optics, it is even possible to observe life on a nanoscale. From Hooke’s observations of cells and his inadvertent discovery of the cell wall, we have since moved forward to engineering plants with modified cell walls. Studies on the chloroplast have also gone from Julius von Sachs’ experiments with chloroplast, to using chloroplast engineering to deliver higher crop yields. Similarly, advances in fluorescent microscopy have made it far easier to observe organelles like chloroplast (once studied by Sachs) or actin (observed by Bohumil Nemec). If physics in the form of cell biology has been responsible for one half of this historical development, biochemistry has surely been the other. This text tells the story of cells as the unit of life in a colorful and student-friendly manner, taking an "essentials only" approach. By using the successful model of previously published Short Courses, this text succeeds in conveying the key points without overburdening readers with secondary information. The authors (all active researchers and educators) skillfully present concepts by illustrating them with clear diagrams and examples from current research. Special boxed sections focus on the importance of cell biology in medicine and industry today. This text is a completely revised, reorganized, and enhanced revision of From Genes to Cells. A Top 25 CHOICE 2016 Title, and recipient of the CHOICE Outstanding Academic Title (OAT) Award. How much energy is released in ATP hydrolysis? How many mRNAs are in a cell? How genetically

similar are two random people? What is faster, transcription or translation?Cell Biology by the Numbers explores these questions and dozens of others provid This text provides readers with a comprehensive study of the mechanics of cell biology that aligns with Core Curriculum requirements in science. Topics covered range from the different types of cells-- plant and animal, eukaryote and prokaryote, and stem cells--to the components of the cell such as the cell wall, DNA, and plasma to cell locomotion and the cell cycle including cell division, mitosis, and meiosis. Finally, the topic of cancer, when cells divide uncontrollably, is addressed. In conclusion, the title offers a biography section of the pioneers of DNA research, Francis Crick, Rosalind Franklin, and James Watson, whose research led us to understand the structure of DNA. Along with authoritative content, this title offers eye-catching and informative images and illustrations to help keep readers engaged. This text is designed to help students appreciate the ways in which experiments and simple calculations can lead to an understanding of how cells work. The new edition of 'A Problems Approach' is completely reorganized and revised to match the fourth edit □The Story of the Cell is a rhyming book about all the little hard workers within our cells. It's an easy and fun way to introduce basic concepts of microbiology to kids through poems and cute illustrations.□ This book discusses the important roles of organelles in a cell by using analogies and easy-to-understand concepts. It's a great educational tool for teachers, parents, and homeschoolers to explain the tiny world of cells in a creative way. A must-have book for all the future biologists, doctors, and scientists out there! What are you waiting for? Let's take a tour of the cell! □□□Includes a Certificate of Excellence at the end of the book! □□□ "Yet another cell and molecular biology book? At the very least, you would think that if I was

going to write a textbook, I should write one in an area that really needs one instead of a subject that already has multiple excellent and definitive books. So, why write this book, then? First, it's a course that I have enjoyed teaching for many years, so I am very familiar with what a student really needs to take away from this class within the time constraints of a semester. Second, because it is a course that many students take, there is a greater opportunity to make an impact on more students' pocketbooks than if I were to start off writing a book for a highly specialized upper-level course. And finally, it was fun to research and write, and can be revised easily for inclusion as part of our next textbook, High School Biology."--Open Textbook Library. The Dictionary of Cell and Molecular Biology, Fifth Edition, provides definitions for thousands of terms used in the study of cell and molecular biology. The headword count has been expanded to 12,000 from 10,000 in the Fourth Edition. Over 4,000 headwords have been rewritten. Some headwords have second, third, and even sixth definitions, while fewer than half are unchanged. Many of the additions were made to extend the scope in plant cell biology, microbiology, and bioinformatics. Several entries related to specific pharmaceutical compounds have been removed, while some generic entries (“alpha blockers, “NSAIDs, and “tetracycline antibiotics, for example), and some that are frequently part of the experimentalist’s toolkit and probably never used in the clinic, have been retained. The Appendix includes prefixes for SI units, the Greek alphabet, useful constants, and single-letter codes for amino acids. Thoroughly revised and expanded by over 20% with over 12,000 entries in cellular and molecular biology Includes expanded coverage of terms, including plant molecular biology, microbiology and biotechnology areas Consistently provides the most

complete short definitions of technical terminology for anyone working in life sciences today Features extensive cross-references Provides multiple definitions, notes on word origins, and other useful features "...This volume is presented as a story or history starting from the moment Mankind began to peek into the microscopic world of cells and microbes with the invention of microscopes-and even earlier, much earlier-continuing through landmark events of false starts and new insights put away for the wrong reasons etc., etc., culminating in the association-induction hypothesis of today."--vii. Elastic filaments refer mainly to titin, the largest of all known proteins. Titin was discovered initially in muscle cells, where it interconnects the thick filament with the Z-line. Titin forms a molecular spring that is responsible for maintaining the structural integrity of contracting muscle, ensuring efficient muscle contraction. More recently, it has become clear that titin is not restricted to muscle cells alone. For example, titin is found in chromosomes of neurons and also in blood platelets. This topic is fast becoming a focal point for research in understanding viscoelastic properties at the molecular, cellular, and tissue levels. In titin may lie a generic basis for biological viscoelasticity. It has become clear that titin may hold the key to certain clinical anomalies. For example, it is clear that titin-based ventricular stiffness is modulated by calcium and that titin is responsible for the altered stiffness in cardiomyopathies. It is also clear from evidence from a group of Finnish families that titin mutations may underlie some muscular dystrophies and that with other mutations chromatids fail to separate during mitosis. Thus, it is clear that this protein will have important clinical implications stemming from its biomechanical role. One aspect of this field is the bringing together of bioengineers with

clinical researchers and biologists. Genetic and biochemical aspects of titin-related proteins are being studied together with front-line engineering approaches designed to measure the mechanics of titin either in small aggregates or in single molecules. The Cell in Mitosis is a collection of papers presented at the First Annual Symposium held on November 6-8, 1961 under the provisions of The Wayne State Fund Research Recognition Award. Contributors focus on the complexities posed by the cell in division and consider topics such as the chemical prerequisites for cell division, the role of the centriole in division cycles, development of the cleavage furrow, chemical aspects of the isolated mitotic apparatus, histone variability, and actin polymerization. This volume is organized into 11 chapters and begins with an overview of cell division, with reference to the basic essential mechanisms of mitogeneses underlying the emergence of the elegant geometries of mitosis. An account of the congression of chromosomes onto metaphase configuration and progression through telophase is also given. The next chapters explore the identity and role of the centriole in the whole life cycle of cell behavior; the fine structure of animal cells during cytokinesis; the mechanism of saltatory particle movements during mitosis; and how chemical and physical agents disrupt the mitotic cycle. A chapter is devoted to the holotrichous ciliate, Tetrahymena pyriformis, paying attention to its fine structure during mitosis. This book will be of interest to physiologists, electron microscopists, light microscopists, biochemists, and others who want to know more about the various aspects of cell division. The last several years have been a landmark period in the ubiquitin field. The breadth of ubiquitin's roles in cell biology was first sketched, and the importance of ubiquitin-dependent proteolysis as a regulatory

mechanism gained general acceptance. The many strands of work that led to this new perception are re counted in this book. A consequence of this progress is that the field has grown dramatically since the first book on ubiquitin was published almost a decade ago [M. Rechsteiner (ed.), Ubiquitin, Plenum Press, 1988]. In this span, students of the cell cycle, transcription, signal transduction, protein sorting, neuropathology, cancer, virology, and immunology have attempted to chart the role of ubi quit in in their particular experimental systems, and this integration of the field into cell biology as a whole continues at a remarkable pace. We hope that for active researchers in the field as well as for newcomers and those on the fence, this book will prove helpful for its breadth, historical perspective, and practical tips. Structural data are now available on many of the components of the ubiquitin pathway. The structures have provided basic insights into the unusual biochemical mechanisms of ubiquitination and proteasome-mediated proteolysis. Because high-speed computer graphics can convey structures more effectively than print media, we have supplemented the figures of the book with a Worldwide Web site that can display the structures in a flexible, viewer-controlled format. Describes the internal landscape of the cell and the work of some of the pioneers who first mapped its features. Includes; what are cells?; ribosomes; the endoplasmic reticulum; the golgi apparatus; lysosomes; and peroxisomes; mitochondria; the cytoskeleton; the surface membrane; receptor proteins, and much more. Glossary. Photos and illustrations. This book covers cell-cell channels at all levels of biological organization. The purpose of this book is to document that cells are not physically separated and fully autonomous units of biological life as stated by the currently valid Cell Theory. If not the cell then some lower level unit must fulfill this role. The book

deals also with the identity of this elusive unit of biological life. Physical Biology of the Cell is a textbook for a first course in physical biology or biophysics for undergraduate or graduate students. It maps the huge and complex landscape of cell and molecular biology from the distinct perspective of physical biology. As a key organizing principle, the proximity of topics is based on the physical concepts that The much-anticipated 3rd edition of Cell Biology delivers comprehensive, clearly written, and richly illustrated content to today's students, all in a user-friendly format. Relevant to both research and clinical practice, this rich resource covers key principles of cellular function and uses them to explain how molecular defects lead to cellular dysfunction and cause human disease. Concise text and visually amazing graphics simplify complex information and help readers make the most of their study time. Clearly written format incorporates rich illustrations, diagrams, and charts. Uses real examples to illustrate key cell biology concepts. Includes beneficial cell physiology coverage. Clinically oriented text relates cell biology to pathophysiology and medicine. Takes a mechanistic approach to molecular processes. Major new didactic chapter flow leads with the latest on genome organization, gene expression and RNA processing. Boasts exciting new content including the evolutionary origin of eukaryotes, super resolution fluorescence microscopy, cryo-electron microscopy, gene editing by CRISPR/Cas9, contributions of high throughput DNA sequencing to understand genome organization and gene expression, microRNAs, IncRNAs, membrane-shaping proteins, organelle-organelle contact sites, microbiota, autophagy, ERAD, motor protein mechanisms, stem cells, and cell cycle regulation. Features specially expanded coverage of genome sequencing and regulation, endocytosis, cancer genomics, the cytoskeleton, DNA damage

response, necroptosis, and RNA processing. Includes hundreds of new and updated diagrams and micrographs, plus fifty new protein and RNA structures to explain molecular mechanisms in unprecedented detail. Aimed at postgraduate students in a variety of biology-related disciplines, this volume presents a collection of mathematical and computational single-cell-based models and their application. The main sections cover four general model groupings: hybrid cellular automata, cellular potts, lattice-free cells, and viscoelastic cells. Each section is introduced by a discussion of the applicability of the particular modelling approach and its advantages and disadvantages, which will make the book suitable for students starting research in mathematical biology as well as scientists modelling multicellular processes. Stem cells have been gaining a lot of attention in recent years. Their unique potential to self-renew and differentiate has turned them into an attractive model for the study of basic biological questions such as cell division, replication, transcription, cell fate decisions, and more. With embryonic stem (ES) cells that can generate each cell type in the mammalian body and adult stem cells that are able to give rise to the cells within a given lineage, basic questions at different developmental stages can be addressed. Importantly, both adult and embryonic stem cells provide an excellent tool for cell therapy, making stem cell research ever more pertinent to regenerative medicine. As the title The Cell Biology of Stem Cells suggests, our book deals with multiple aspects of stem cell biology, ranging from their basic molecular characteristics to the in vivo stem cell trafficking of adult stem cells and the adult stem-cell niche, and ends with a visit to regeneration and cell fate reprogramming. In the first chapter, “Early embryonic cell fate decisions in the mouse”, Amy Ralson and Yojiro Yamanaka describe the mechanisms that support early developmental decisions in the

mouse pre-implantation embryo and the current understanding of the source of the most immature stem cell types, which includes ES cells, trophoblast stem (TS) cells and extraembryonic endoderm stem (XEN) cells. Your body has trillions of cells, and each one has the complexity and dynamism of a city. Your life, your thoughts, your diseases, and your health are all the function of cells. But what do you really know about what goes on inside you? The last time most people thought about cells in any detail was probably in high school or a college general biology class. But the field of cell biology has advanced incredibly rapidly in recent decades, and a great deal of what we may have learned in high school and college is no longer accurate or particularly relevant. The Cell: Inside the Microscopic World that Determines Our Health, Our Consciousness, and Our Future is a fascinating story of the incredible complexity and dynamism inside the cell and of the fantastic advancements in our understanding of this microscopic world. Dr. Joshua Z. Rappoport is at the forefront of this field, and he will take you on a journey to discover: A deeper understanding of how cells work and the basic nature of life on earth. Fascinating histories of some of the key discoveries from the seventeenth century to the last decade and provocative thoughts on the current state of academic research. The knowledge required to better understand the new developments that are announced almost weekly in science and health care, such as cancer, cellular therapies, and the potential promise of stem cells. The ability to make better decisions about health and to debunk the misinformation that comes in daily via media. Using the latest scientific research, The Cell illustrates the diversity of cell biology and what it all means for your everyday life. "This book attempts to make a comprehensive, interdisciplinary case for a new view of the origin of life"--

Prologue. The Problems Book helps students appreciate the ways in which experiments and simple calculations can lead to an understanding of how cells work by introducing the experimental foundation of cell and molecular biology. Each chapter reviews key terms, tests for understanding basic concepts, and poses research-based problems. The Problems Book has be Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand.We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts. All living things on Earth are composed of cells. A cell is the simplest unit of a self-contained living organism,

and the vast majority of life on Earth consists of single-celled microbes, mostly bacteria. These consist of a simple 'prokaryotic' cell, with no nucleus. The bodies of more complex plants and animals consist of billions of 'eukaryotic' cells, of varying kinds, adapted to fill different roles - red blood cells, muscle cells, branched neurons. Each cell is an astonishingly complex chemical factory, the activities of which we have only begun to unravel in the past fifty years or so through modern techniques of microscopy, biochemistry, and molecular biology. In this Very Short Introduction, Terence Allen and Graham Cowling describe the nature of cells - their basic structure, their varying forms, their division, their differentiation from initially highly flexible stem cells, their signalling, and programmed death. Cells are the basic constituent of life, and understanding cells and how they work is central to all biology and medicine. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable. This comprehensive history of cell evolution “deftly discusses the definition of life” as well as cellular organization, classification and more (San Francisco Book Review). The origin of cells remains one of the most fundamental mysteries in biology, one that has spawned a large body of research and debate over the past two decades. With In Search of Cell History, Franklin M. Harold offers a comprehensive, impartial take on that research and the controversies that keep the field in turmoil. Written in accessible language and complemented by a glossary for easy reference, this book examines the relationship

between cells and genes; the central role of bioenergetics in the origin of life; the status of the universal tree of life with its three stems and viral outliers; and the controversies surrounding the last universal common ancestor. Harold also discusses the evolution of cellular organization, the origin of complex cells, and the incorporation of symbiotic organelles. In Search of Cell History shows us just how far we have come in understanding cell evolution—and the evolution of life in general—and how far we still have to go. “Wonderful…A loving distillation of connections within the incredible diversity of life in the biosphere, framing one of biology’s most important remaining questions: how did life begin?”—Nature This book vividly describes how complex and integrated movements can arise from the properties and behaviors of biological molecules. It provides a uniquely integrated account in which the latest findings from biophysics and molecular biology are put into the context of living cells. This second edition is updated throughout with recent advances in the field and has a completely revised and redrawn art program. The text is suitable for advanced undergraduates, graduate students, and for professionals wishing for an overview of this field. Elegant, suggestive, and clarifying, Lewis Thomas's profoundly humane vision explores the world around us and examines the complex interdependence of all things. Extending beyond the usual limitations of biological science and into a vast and wondrous world of hidden relationships, this provocative book explores in personal, poetic essays to topics such as computers, germs, language, music, death, insects, and medicine. Lewis Thomas writes, "Once you have become permanently startled, as I am, by the realization that we are a social species, you tend to keep an eye out for the pieces of evidence that this is, by and large, good for us." Since World War II, cell biology

and molecular biology have worked separately in probing the central question of cancer research. But a new alliance is being forged in the effort to conquer cancer. Drawing on more than 500 classic and recent references, Baserga's work provides the unifying background for this cross-fertilization of ideas. The Tale of the Cell is a picture book about the trials that children and adults experience while battling Sickle Cell Disease. While Gia goes through the joys and pains of living with Sickle Cell, she never looses her confidence because her "Dream Team" is by her side. The adventure to raise awareness about living with Sickle Cell Disease begins with the Tale of the Cell. Winner of the 2023 PROSE Award for Excellence in Biological and Life Sciences and the 2023 Chautauqua Prize! Named a New York Times Notable Book and a Best Book of the Year by The Economist, Oprah Daily, BookPage, Book Riot, the New York Public Library, and more! In The Song of the Cell, the extraordinary author of the Pulitzer Prize–winning The Emperor of All Maladies and the #1 New York Times bestseller The Gene “blends cutting-edge research, impeccable scholarship, intrepid reporting, and gorgeous prose into an encyclopedic study that reads like a literary page-turner” (Oprah Daily). Mukherjee begins this magnificent story in the late 1600s, when a distinguished English polymath, Robert Hooke, and an eccentric Dutch cloth-merchant, Antonie van Leeuwenhoek looked down their handmade microscopes. What they saw introduced a radical concept that swept through biology and medicine, touching virtually every aspect of the two sciences, and altering both forever. It was the fact that complex living organisms are assemblages of tiny, self-contained, self-regulating units. Our organs, our physiology, our selves—hearts, blood, brains—are built from these compartments. Hooke

christened them “cells.” The discovery of cells—and the reframing of the human body as a cellular ecosystem—announced the birth of a new kind of medicine based on the therapeutic manipulations of cells. A hip fracture, a cardiac arrest, Alzheimer’s dementia, AIDS, pneumonia, lung cancer, kidney failure, arthritis, COVID pneumonia—all could be reconceived as the results of cells, or systems of cells, functioning abnormally. And all could be perceived as loci of cellular therapies. Filled with writing so vivid, lucid, and suspenseful that complex science becomes thrilling, The Song of the Cell tells the story of how scientists discovered cells, began to understand them, and are now using that knowledge to create new humans. Told in six parts, and laced with Mukherjee’s own experience as a researcher, a doctor, and a prolific reader, The Song of the Cell is both panoramic and intimate—a masterpiece on what it means to be human. “In an account both lyrical and capacious, Mukherjee takes us through an evolution of human understanding: from the seventeenth-century discovery that humans are made up of cells to our cutting-edge technologies for manipulating and deploying cells for therapeutic purposes” (The New Yorker). New edition exploring the mechanical features of biological cells for advanced undergraduate and graduate students in physics and biomedical engineering. This book deals with the role of water in cell function. Long recognized to be central to cell function, water’s role has not received the attention lately that it deserves. This book brings the role of water front and central. It presents the most recent work of the leading authorities on the subject, culminating in a series of sometimes astonishing observations. This volume will be of interest to a broad audience. A systematic and mathematically accessible introductory text explaining cell functions through the

engineering principles of robust devices. The first atlas in many years giving researchers a good visual reference of the status of their cell lines. Given the increasing importance of well defined cellular models in particular in biomedical research this is a sorely needed resource for everyone performing cell culture. “Handsome and elegantly designed, this tour through the cell’s history and diversity in form and function is a delight to peruse . . . stunning.” —American Scientist With The Cell, Jack Challoner treats readers to a visually striking tour of these remarkable molecular machines. Most of the living things we’re familiar with—the plants in our gardens, the animals we eat—are composed of billions or trillions of cells. Most multicellular organisms consist of many different types of cells, each highly specialized to play a particular role—from building bones or producing the pigment in flower petals to fighting disease or sensing environmental cues. But the great majority of living things on our planet exist as single cell. These cellular singletons are every bit as successful and diverse as multicellular organisms, and our very existence relies on them. The book is an authoritative yet accessible account of what goes on inside every living cell—from building proteins and producing energy to making identical copies of themselves—and the importance of these chemical reactions both on the familiar everyday scale and on the global scale. Along the way, Challoner sheds light on many of the most intriguing questions guiding current scientific research: What special properties make stem cells so promising in the treatment of injury and disease? How and when did single-celled organisms first come together to form multicellular ones? And how might scientists soon be prepared to build on the basic principles of cell biology to build similar living cells from scratch? “Small really is

beautiful: Psychedelic images show the inner workings of cells in stunning detail.” —Daily Mail The Biology of the Cell Surface is a book by American biologist Ernest Everett Just. It was published by P. Blakiston's Son & Co in 1939. Just began writing the book in 1934 in Naples and finished it in France, shortly before being sent to a prisoner-of-war camp. He considered the book to be his "crowning achievement". The book examined the role of the cell surface in embryology, development and evolution, and presented a critique of gene theory, particularly the views of Jacques Loeb. Sapp suggests that "Just's theorizing on the cell cortex [in this work] was unsurpassed."