The Human Microbiome The Germs That Keep You Heal

"Life cycle nutrition texts generally lack specificity when it comes to breaking down each portion of the lifespan. Nutrition Across Life Stages carefully differentiates different segments of the pediatric and geriatric populations, providing a comprehensive rundown of normal and clinical nutrition for lactation, infancy, early childhood, older adult, and geriatric populations"--

Trillions and trillions of microbial cells live on and inside your body. A small number of these microbes are unhealthy germs. But most belong on your body and perform essential jobs. Microbes help digest your food, protect you from dangerous germs, and help your body fight disease. Using techniques such as DNA sequencing, scientists are uncovering the many secrets of the human microbiome. Scientists are learning how the foods we eat and the medicines we take, such as microbe-killing antibiotics, can affect the bugs in our bodies. They are learning more and more about this system that keeps us healthy and how we can protect it in return.

None of us are ever really alone not with the trillions and trillions of microbes that call our bodies home. Recent scientific research has uncovered just how interdependent our relationships with these tiny hitchhikers are, and that lots of them are actually good for us! Filled with intriguing information and just enough yuck factor, kids will be thrilled to discover what a big deal these small critters who live in and on their bodies are. No hand sanitizer required!

Probiotic microorganisms are recognised as being beneficial for human health. Prebiotics are substrates that are used preferentially by the probiotic bacteria for their growth. A great deal of interest has been generated in recent years in identifying probiotic bacteria and prebiotics, their characterization, mechanisms of action and their role in the prevention and management of human health disorders. Together they are referred to as synbiotic. This book is in response to the need for more current and global scope of probiotics and prebiotics. It contains chapters written by internationally recognized authors. The book has been planned to meet the needs of the researchers, health professionals, government regulatory agencies and industries. This book will serve as a standard reference book in this important and fast-growing area of probiotics and prebiotics in human nutrition and health.

Pollinators in Crisis

The Impact of the Microbiome on Mental Health

Ethical, Legal and Social Concerns

Microbes and the Mind

How the Microbiome Is Revolutionizing the Pursuit of a Healthy Life

Inside Your Insides

The Human Microbiome, Diet, and Health

The human microbiome is the bacteria, viruses, and fungi that cover our skin, line our intestines, and flourish in our body cavities. Work on the human microbiome is new, but it is quickly becoming a leading area of biomedical research. What scientists are learning about humans and our microbiomes could change medical practice by introducing new treatment modalities. This new knowledge redefines us as superorganisms comprised of the human body and the collection of microbes that inhabit it and reveals how much we are a part of our environment. The understanding that microbes are not only beneficial but sometimes necessary for survival recasts our interaction with microbes from adversarial to neighborly. This volume explores some of the science that makes human microbiome research possible. It then considers ethical, legal, and social concerns raised by microbiome research. Chapters explore issues related to personal identity, property rights, and privacy. The authors reflect on how human microbiome research challenges reigning views on public health and research ethics. They also address the need for thoughtful policies and procedures to guide the use of the biobanked human samples required for advancing this new domain of research. In the course of these explorations, they introduce examples from the history of biomedical science and recent legal cases that shed light on the issues and inform the policy recommendations they offer at the end of each topic's discussion. This volume is the product of an NIH Human Microbiome Project grant. It represents three years of conversations focused on consensus formation by the twenty-seven members of the interdisciplinary Microbiome Working Group. "The microbiome is a relatively new area of medical attention. Ethical issues related to the microbiome have barely been identified, much less carefully analyzed. This volume is an excellent start toward that ethical analysis. Many of the arguments are persuasive and provocative. In particular, some contributors challenge the ethical need for anonymizing microbiome specimens as well as the need for individual informed consent for specific uses of these specimens. I highly recommend this volume for all those interested in the microbiome and in new frontiers in medical ethics." -Leonard M. Fleck, Michigan State University

The Human Biome is a complex and essential biological system within the human body. The adult human harbors some 100 trillion bacteria in his gut alone. Balance of this system is essential to good health. This issue of Clinics in Laboratory Medicine focuses on treatments to realign this balance as well as advances in understanding the system in general. Topics include: Changes in microbiome in GERD; The relationship of microbiome, inflammation, and colon cancer; Gut microbiome and host genetics in Crohn's disease; Association of oral microbiome with head and neck cancer; The vaginal microbiome-disease, genetics and the environment;, The human virome in children and its relationship to febrile illness; Gut microbiome in irritable bowel syndrome; The neonatal microbiome and necrotizing enterocolitis; Fecal microbiota transplantation for clostridium difficile Infection.

This book offers a unique perspective on the invisible organ, a body part that has been visualized only recently. It guides the readers into the world of the microbial constituents that make humans the way they are. The vitamins they produce, the smell they generate, the signals they create, and the molecular guards they elaborate are some of the benefits they bestow on humans. After introducing the notion as to why microbes are an integral component in the development of humans, the book examines the genesis of the microbiome and describes how the resident bacteria work in partnership with the skin, digestive tract, sexual organs, mouth and lungs to execute vital physiological functions. It then discusses the diseases that are triggered by the disruption of the harmonious relationships amongst these diverse systems and provides microbial cures to ailments such as obesity and digestive complications. Finally, the book focuses on the future when the workings of the human microbes will be fully unravelled. Societal changes in health education, the establishment of the microbiome bank, the fight against hunger, space travel, designer traits and enhanced security are explained. Each chapter is accompanied by captivating illustrations and ends with a visual summary. Dr. Appanna has been researching for over 30 years on various aspects of microbial and human cellular systems. He is a professor of biochemistry and has also served as Department Chair and Dean of the Faculty at Laurentian University, Sudbury, Canada. The book is aimed at readers enrolled in medical, chiropractic, nursing, pharmacy, and health science programs. Practicing health-care professionals and continuing education learners will also find the content beneficial.

THE NEW YORK TIMES BESTSELLER FROM THE WINNER OF THE 2021 PULITZER PRIZE Your body is teeming with tens of trillions of microbes. It's an entire world, a colony full of life. In other words, you contain multitudes. They sculpt our organs, protect us from diseases, guide our behaviour, and bombard us with their genes. They also hold the key to understanding all life on earth. In I Contain Multitudes, Ed Yong opens our eyes and invites us to marvel at ourselves and other animals in a new light, less as individuals and more as thriving ecosystems. You'll never think about your mind, body or preferences in the same way again. 'Super-interesting... He just keeps imparting one surprising, fascinating insight after the next. I Contain Multitudes is science journalism at its best' Bill Gates SHORTLISTED FOR THE WELLCOME BOOK PRIZE 2017 SHORTLISTED FOR THE ROYAL SOCIETY SCIENCE BOOK PRIZE 2017

A Laboratory Experience

A Research Agenda for Indoor Microbiology, Human Health, and Buildings

The Microbiome Solution

The Human Microbiome

From Microbes to Millipedes, Camel Crickets, and Honeybees, the Natural History of Where We Live

Good Bacteria for Healthy Skin

Inflammation, Infection, and Microbiome in Cancers

Do plants really move? Absolutely! You might be surprised by all ways plants can move. Plants might not pick up their roots and walk away, but they definitely don't sit still! Discover the many ways plants (and their seeds) move. Whether it's a sunflower, a Venus flytrap, or an exotic plant like an exploding cucumber, this fascinating picture book shows just how excitingly active plants really are.

This accessibly written, comprehensive summary of research findings on the gut microbiome and its implications for health and disease--a topic of growing interest and concern--serves as an essential resource for teachers and students. * Presents the most recent gut microbiome research in a way that is accessible to students interested in biological sciences and nutrition studies * Includes engaging sidebars and case studies that serve to better illustrate the connections between gut microbiota, human physiology, and chronic disease * Provides insight into the role of nutrition in shaping the gut microbiota and suggestions for improving human health

Making Peace with Microbes Public sanitation and antibiotic drugs have brought about historic increases in the human life span; they have also unintentionally produced new health crises by disrupting the intimate, age-old balance between humans and the microorganisms that inhabit our bodies and our environment. As a result, antibiotic resistance now ranks among the gravest medical problems of modern times. Good Germs, Bad Germs addresses not only this issue but also what has become known as the "hygiene hypothesis"— an argument that links the over-sanitation of modern life to now-epidemic increases in immune and other disorders. In telling the story of what went terribly wrong in our war on germs, Jessica Snyder Sachs explores our emerging understanding of the symbiotic relationship between the human body and its resident microbes—which outnumber its human cells by a factor of nine to one! The book also offers a hopeful look into a future in which antibiotics will be designed and used more wisely, and beyond that, to a day when we may replace antibacterial drugs and cleansers with bacterial ones—each custom-designed for maximum health benefits.

In class or in practice, all of the A & P information you need is at fingertips in this handy, easy-to-understand pocket guide. Crystal-clear, full-color illustrations with concise labels put all the need-to-know A&P information at your fingertips. Whether you're looking for a cross section of the spinal cord or lateral view of the arteries of the head and neck, or any other perspective on the human body, you'll find it here.

The Gut Microbiome

Proceedings of the 7th International Workshop Soft Computing Applications (SOFA 2016) , Volume 1

The Microbiome and Our Health

Microbes

Nurture Your Skin Microbiome with Pre- and Probiotics for Clear and Luminous Skin

Cell Biology by the Numbers

Nutrition Across Life Stages

Allergies, asthma, obesity, acne: these are just a few of the conditions that may be caused—and someday cured—by the microscopic life inside us. The key is to understand how this groundbreaking science influences your health, mood, and more. In just the last few years, scientists have shown how the microscopic life within our bodies— particularly within our intestines—has an astonishing impact on our lives. Your health, mood, sleep patterns, eating preferences—even your likelihood of getting bitten by mosquitoes—can be traced in part to the tiny creatures that live on and inside of us. In Follow Your Gut, pioneering scientist Rob Knight pairs with award-winning science journalist Brendan Buhler to explain—with good humor and easy-to-grasp examples—why these new findings matter to everyone. They lead a detailed tour of the previously unseen world inside our bodies, calling out the diseases and conditions believed to be most directly impacted by them. With a practical eye toward deeper knowledge and better decisions, they also explore the known effects of antibiotics, probiotics, diet choice and even birth method on our children's lifelong health. Ultimately, this pioneering book explains how to learn about your own microbiome and take steps toward understanding and improving your health, using the latest research as a guide.

Why are you attracted to a certain "type?" Why are you a morning person? Why do you vote the way you do? From a witty new voice in popular science comes a clever, life-changing look at what makes you you. "I can't believe I just said that." "What possessed me to do that?" "What's wrong with me?" We're constantly seeking answers to these fundamental human questions, and now, science has the answers. The foods we enjoy, the people we love, the emotions we feel, and the beliefs we hold can all be traced back to our DNA, germs, and environment. This witty, colloquial book is popular science at its best, describing in everyday language how genetics, epigenetics, microbiology, and psychology work together to influence our personality and actions. Mixing cutting-edge research and relatable humor, Pleased to Meet Me is filled with fascinating insights that shine a light on who we really are--and how we might become our best selves.

Nourish Your Skin's Ecosystem for A Healthy Glow You probably know all about your gut microbiome. But what about the microbiome on your body's biggest organ? Studies show that a diverse and thriving ecosystem of bacteria and other microbes on your skin affects a wide array of health issues. Your body's flora is the first line of defense against infection and impacts many skin conditions like psoriasis, eczema, and acne. It protects your skin from harmful invaders and strengthens its moisture barrier. So how can you take care of the good bacteria that maintains balanced, healthy skin? Written by a skin microbiome expert, Good Bacteria for Healthy Skin is a friendly, comprehensive, science-backed exploration of what this complex system is, what it does, and how to nourish it. You'll learn about how your lifestyle affects your skin microbiome, how microbiome imbalances impact skin conditions, and the benefits of probiotics and prebiotics. You'll also discover a skin detox plan and a beauty wellness regimen to keep your good bacteria happy and your skin looking healthy, youthful, and fresh!

Joining the ranks of popular science classics like The Botany of Desire and The Selfish Gene, a groundbreaking, wondrously informative, and vastly entertaining examination of the most significant revolution in biology since Darwin—a "microbe's-eye view" of the world that reveals a marvelous, radically reconceived picture of life on earth. Every animal, whether human, squid, or wasp, is home to millions of bacteria and other microbes. Ed Yong, whose humor is as evident as his erudition, prompts us to look at ourselves and our animal companions in a new light—less as individuals and more as the interconnected, interdependent multitudes we assuredly are. The microbes in our bodies are part of our immune systems and protect us from disease. In the deep oceans, mysterious creatures without mouths or guts depend on microbes for all their energy. Bacteria provide squid with invisibility cloaks, help beetles to bring down forests, and allow worms to cause diseases that afflict millions of people. Many people think of microbes as germs to be eradicated, but those that live with us—the microbiome—build our bodies, protect our health, shape our identities, and grant us incredible abilities. In this astonishing book, Ed Yong takes us on a grand tour through our microbial partners, and introduces us to the scientists on the front lines of discovery. It will change both our view of nature and our sense of where we belong in it.

Dirt Is Good

The Life-Changing Story of Germs

The Microbes Within Us and a Grander View of Life

A Guide to the Microbes That Call You Home

The Advantage of Germs for Your Child's Developing Immune System

Plants Can't Sit Still

Soft Computing Applications

Microbes can now be found in nearly every niche the human body offers. However, the complexity of the microbiota of a given site depends on the particular environmental condition thereof. Only microbes which are able to grow under these conditions, will prevail. Recent publications imply that the microorganisms do not only have multiple, critical consequences for host physiological processes such as postnatal development, immunomodulation and energy supply, but also effects on neurodevelopment, behavior and cognition. Within this book we will focus on the techniques behind these developments, epigenomics and on the various parts of the human body which are inhabited by microorganism such as the mouth, the gut, the skin and the vagina. In addition, chapters are dedicated to the possible manipulations of the microbiota by probiotics, prebiotics and faecal transplantation.

'This book might change your perspective on real cleanliness . . . and along the way help you to raise healthier kids. ' Giulia Enders, author of Gut 'A must-read for parents ... Let Them Eat Dirt takes you inside the inside tract of a child's gut, and shows you how to give kids the best immune start early in life.' William Sears, MD, co-author of The Baby Book We all want what is best for our kids, but for years we've believed that microbes cause infectious diseases and have battled to keep them under control. Our modern lifestyle, with its emphasis on hyper-cleanliness, is having a negative effect on our children's lifelong health. In Let Them Eat Dirt, microbiologists B. Brett Finlay and Marie-Claire Arrieta explain how the trillions of microbes that live in and on our bodies influence childhood development and why an imbalance in those microbes can lead to obesity, diabetes and asthma, among other chronic conditions. With practical advice from conception through to pregnancy and beyond, this invaluable guide will help you to nurture stronger, more resilient and healthier children.

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

From two of the world's top scientists and one of the world's top science writers (all parents), Dirt Is Good is a q&a-based guide to everything you need to know about kids & germs. "Is it OK for my child to eat dirt?" That's just one of the many questions authors Jack Gilbert and Rob Knight are bombarded with every week from parents all over the world. They've heard everything from "My two-year-old gets constant ear infections. Should I give her antibiotics? Or probiotics?" to "I heard that my son's asthma was caused by a lack of microbial exposure. Is this true, and if so what can I do about it now?" Google these questions, and you'll be overwhelmed with answers. The internet is rife with speculation and misinformation about the risks and benefits of what most parents think of as simply germs, but which scientists now call the microbiome: the combined activity of all the tiny organisms inside our bodies and the surrounding environment that have an enormous impact on our health and well-being. Who better to turn to for answers than Drs. Gilbert and Knight, two of the top scientists leading the investigation into the microbiome—an investigation that is producing fascinating discoveries and bringing answers to parents who want to do the best for their young children. Dirt Is Good is a comprehensive, authoritative, accessible guide you've been searching for.

Microbiology

Let Them Eat Dirt

Evidence, Mechanisms, and Implications

Follow Your Gut

a radical new way to heal your body from the inside out

How Microbes Can Make Your Child Healthier

How the Overuse of Antibiotics Is Fueling Our Modern Plagues

As a group of organisms that are too small to see and best known for being agents of disease and death, microbes are not always appreciated for the numerous supportive and positive contributions they make to the living world. Designed to support a course in microbiology, Microbiology: A Laboratory Experience permits a glimpse into both the good and the bad in the microscopic world. The laboratory experiences are designed to engage and support student interest in microbiology as a topic, field of study, and career. This text provides a series of laboratory exercises compatible with a one-semester undergraduate microbiology or bacteriology course with a three- or four-hour lab period that meets once or twice a week. The design of the lab manual conforms to the American Society for Microbiology curriculum guidelines and takes a ground-up approach -- beginning with an introduction to biosafety and containment practices and how to work with biological hazards. From there the course moves to basic but essential microscopy skills, aseptic technique and culture methods, and builds to include more advanced lab techniques. The exercises incorporate a semester-long investigative laboratory project designed to promote the sense of discovery and encourage student engagement. The curriculum is rigorous but manageable for a single semester and incorporates best practices in biology education.

In the book Microbial Biofilms: Importance and applications, eminent scientists provide an up-to-date review of the present and future trends on biofilm-related research. This book is divided with four subdivisions as biofilm fundamentals, applications, health aspects, and their control. Moreover, this book also provides a comprehensive account on microbial interactions in biofilms, pyocyanin, and extracellular DNA in facilitating Pseudomonas aeruginosa biofilm formation, atomic force microscopic studies of biofilms, and biofilms in beverage industry. The book comprises a total of 21 chapters from valued contributions from world leading experts in Australia, Bulgaria, Canada, China, Serbia, Germany, Italy, Japan, the United Kingdom, the Kingdom of Saudi Arabia, Republic of Korea, Mexico, Poland, Portugal, and Turkey. This book may be used as a text or reference for everyone interested in biofilms and their applications. It is also highly recommended for environmental microbiologists, soil scientists, medical microbiologists, bioremediation experts, and microbiologists working in biocorrosion, biofouling, biodegradation, water microbiology, quorum sensing, and many other related areas. Scientists in academia, research laboratories, and industry will also find it of interest.

This book offers a summary and discussion of the advances of inflammation and infection in various cancers. The authors cover the classically known virus infections in cancer, novel roles of other pathogens (e.g. bacteria and fungi), as well as biomarkers for diagnosis and therapy. Further, the chapters highlight the progress of immune therapy, stem cells and the role of the microbiome in the pathophysiology of cancers. Readers will gain insights into complex microbial communities, that inhabit most external human surfaces and play a key role in health and disease. Perturbations of host-microbe interactions often lead to altered host responses that can promote cancer development. Thus, this book highlights emerging roles of the microbiome in pathogenesis of cancers and outcome of therapy. The focus is on mechanistic concepts that underlie the complex relationships between host and microbes. Approaches that can inhibit infection, suppress chronic inflammation and reverse the dysbiosis are discussed, as a means for restoring the balance between host and microbes. This comprehensive work will be beneficial to researchers and students interested in infectious diseases, microbiome, and cancer as well as clinicians and general physiologists.

Since the dawn of the human race, germs have been making us sick. Whether the ailment is a cold, the flu, diabetes, obesity or certain cancers, the likely cause is germs. Our ancient enemies have four families - bacteria, viruses, fungi, and protozoa - and many names: Ebola, E. coli, salmonella, norovirus, gonorrhea. . . Human beings are engaged in a "war on germs," in which we develop ever-more sophisticated weapons and defensive strategies. But it is a war we can never win. Our best plan for staying as healthy is to choose our battles carefully, and try to co-exist with germs as best we can. The Germ Code is a wise, witty and wonderfully readable guide to our relationship with these infinitesimal but infinitely powerful creatures. Microbiologist Jason Tetro takes us outside the lab and shows the enormous influence of germs upon humanity's past, present and future. He unlocks the mysteries of "the germ code" to reveal how these organisms have exploited our every activity and colonized every corner of the earth. From his own research and personal experience, Tetro relates how the most recent flu pandemic happened, how others may have been averted and how more may come about if we aren't careful. He also explains that not every germ is our foe, and offers advice on harnessing the power of good germs to stay healthy and make our planet a better place. The Germ Code is a fascinating journey through an unseen world, an essential manual to living in harmony with germs and a life-enhancing (as well as life-saving!) good read.

Welcome to the Microbiome

Importance and Applications

The Microbiome Diet

Missing Microbes

Cultured

Never Home Alone

Microbial Biofilms

A natural history of the wilderness in our homes, from the microbes in our showers to the crickets in our basements Even when the floors are sparkling clean and the house seems silent, our domestic domain is wild beyond imagination. In Never Home Alone, biologist Rob Dunn introduces us to the nearly 200,000 species living with us in our own homes, from the Egyptian meal moths in our cupboards and camel crickets in our basements to the lactobacillus lounging on our kitchen counters. You are not alone. Yet, as we obsess over sterilizing our homes and separating our spaces from nature, we are unwittingly cultivating an entirely new playground for evolution. These changes are reshaping the organisms that live with us -- prompting some to become more dangerous, while undermining those species that benefit our bodies or help us keep more threatening organisms at bay. No one who reads this engrossing, revelatory book will look at their homes in the same way again.

A critically important and startling look at the harmful effects of overusing antibiotics, from the field's leading expert Tracing one scientist's journey toward understanding the crucial importance of the microbiome, this revolutionary book will take readers to the forefront of trail-blazing research while revealing the damage that overuse of antibiotics is doing to our health: contributing to the rise of obesity, asthma, diabetes, and certain forms of cancer. In Missing Microbes, Dr. Martin Blaser invites us into the wilds of the human microbiome where for hundreds of thousands of years bacterial and human cells have existed in a peaceful symbiosis that is responsible for the health and equilibrium of our body. Now, this invisible eden is being irrevocably damaged by some of our most revered medical advances—antibiotics—threatening the extinction of our irreplaceable microbes with terrible health consequences. Taking us into both the lab and deep into the fields where these troubling effects can be witnessed firsthand, Blaser not only provides cutting edge evidence for the adverse effects of antibiotics, he tells us what we can do to avoid even more catastrophic health problems in the future.

Interest in the mind-body connection has grown in recent years, with accumulating evidence showing that the gut microbiome can alter behavioral, neural, and psychological outcomes. This publication brings together a group of international experts who are investigating the microbiome and its potential to contribute to the causes and treatment of mental illness. The contributions are not aimed solely at specialists in clinical and experimental neuroscience. They cover a range of key topics, including the role of the microbiome in mental health and specific psychiatric disorders that occur across the lifespan, interactions with the immune system, diet, and pharmacological interventions. Furthermore, the microbial metabolite production and the potential for psychobiotic interventions that target the microbiome to improve mental health outcomes are discussed. This book is unique in its focus on the mechanisms and consequences of the activities of gut microorganisms in mental health and illness, providing expert insight into the current state of the art and important future directions for this emerging area of research. Additionally, it provides an excellent knowledge base for newcomers and a refresher for researchers and clinicians working in the fields of neuroscience, psychology, or psychiatry.

The Food Forum convened a public workshop on February 22-23, 2012, to explore current and emerging knowledge of the human microbiome, its role in human health, its interaction with the diet, and the translation of new research findings into tools and products that improve the nutritional quality of the food supply. The Human Microbiome, Diet, and Health: Workshop Summary summarizes the presentations and discussions that took place during the workshop. Over the two day workshop, several themes covered included: The microbiome is integral to human physiology, health, and disease. The microbiome is arguably the most intimate connection that humans have with their external environment, mostly through diet. Given the emerging nature of research on the microbiome, some important methodology issues might still have to be resolved with respect to undersampling and a lack of causal and mechanistic studies. Dietary interventions intended to have an impact on host biology via their impact on the microbiome are being developed, and the market for these products is seeing tremendous success. However, the current regulatory framework poses challenges to industry interest and investment.

Microbiota of the Human Body

The Germs That Keep You Healthy

Exploring the Connection Between Microbes, Diet, and Health

Good Germs, Bad Germs

Health, Healing and Beyond

Genes, Germs, and the Curious Forces That Make Us Who We Are

Microbiomes of the Built Environment

Why the microbiome--our rich inner ecosystem of microorganisms--may hold the keys to human health. We are at the dawn of a new scientific revolution. Our understanding of how to treat and prevent diseases has been transformed by knowledge of the microbiome--the rich ecosystem of microorganisms that is in and on every human. These microbial hitchhikers may hold the keys to human health. In Gut Feelings, Alessio Fasano and Susie Flaherty show why we must go beyond the older, myopic view of microorganisms as our enemies to a broader understanding of the microbiome as a parallel civilization that we need to understand, respect, and engage with for the benefit of our own health.

People's desire to understand the environments in which they live is a natural one. People spend most of their time in spaces and structures designed, built, and managed by humans, and it is estimated that people in developed countries now spend 90 percent of their lives indoors. As people move from homes to workplaces, traveling in cars and on transit systems, microorganisms are continually with and around them. The human-associated microbes that are shed, along with the human behaviors that affect their transport and removal, make significant contributions to the diversity of the indoor microbiome. The characteristics of "healthy" indoor environments cannot yet be defined, nor do microbial, clinical, and building researchers yet understand how to modify features of indoor environmentsâ€"such as building ventilation systems and the chemistry of building materialsâ€"in ways that would have predictable impacts on microbial communities to promote health and prevent disease. The factors that affect the environments within buildings, the ways in which building characteristics influence the composition and function of indoor microbial communities, and the ways in which these microbial communities relate to human health and well-being are extraordinarily complex and can be explored only as a dynamic, interconnected ecosystem by engaging the fields of microbial biology and ecology, chemistry, building science, and human physiology. This report reviews what is known about the intersection of these disciplines, and how new tools may facilitate advances in understanding the ecosystem of built environments, indoor microbiomes, and effects on human health and well-being. It offers a research agenda to generate the information needed so that stakeholders with an interest in understanding the impacts of built environments will be able to make more informed decisions.

A revealing look at the 300 trillion microorganisms that keep us healthy—and the foods they need to thrive These days, probiotic yogurt and other "gut-friendly" foods line supermarket shelves. But what's the best way to feed our all-important microbiome—and what is a microbiome, anyway? In this engaging and eye-opening book, science journalist Katherine Harmon Courage investigates these questions, presenting a deep dive into the ancient food traditions and the latest research for maintaining a healthy gut. Courage's insights include: • Meet your microbiome: What it is, how it works, and why it's essential for our immune system--and overall health • Gut-friendly food traditions: A guided tour of artisanal makers of yogurt, kimchi, kefir, kombucha, olives, cocoa, and other vibrant, ancient foods from around the world that feed our microbiome (along with simple recipes for curious at-home cooks) • Cutting-edge science: A first-hand look at some of the top lab facilities where microbiologists are working to better understand the human gut and how to feed it for good health Equal parts science explainer, culinary investigation, and global roadmap for healthy eating, Cultured offers a wealth of information for anyone interested in making smart food choices in our not-so-gut-friendly modern world.

Thousands of different microbial species colonize the human body, and are essential for our survival. This book presents a review of the current understanding of human microbiomes, the functions that they bring to the host, how we can model them, their role in health and disease and the methods used to explore them. Current research into areas such as the long-term effect of antibiotics makes this a subject of considerable interest. This title is essential reading for researchers and students of microbiology.

The Human Microbiota and Microbiome

The Scientifically Proven Way to Restore Your Gut Health and Achieve Permanent Weight Loss

I Contain Multitudes

The Enormous Impact of Tiny Microbes

The Human Superorganism

Implications in Health and Disease

How Ancient Foods Can Feed Our Microbiome

"Eyeopening... Fascinating... may presage a paradigm shift in medicine." —Kirkus Reviews (starred review) "Teeming with information and big ideas... Outstanding." —Booklist (starred review) The origin of asthma, autism, Alzheimer's, allergies, cancer, heart disease, obesity, and even some kinds of depression is now clear. Award-winning researcher on the microbiome, professor Rodney Dietert presents a new paradigm in human biology that has emerged in the midst of the ongoing global epidemic of noncommunicable diseases. The Human Superorganism makes a sweeping, paradigm-shifting argument. It demolishes two fundamental beliefs that have blinkered all medical thinking until very recently: 1) Humans are better off as pure organisms free of foreign microbes; and 2) the human genome is the key to future medical advances. The microorganisms that we have sought to eliminate have been there for centuries supporting our ancestors. They comprise as much as 90 percent of the cells in and on our bodies—a staggering percentage! More than a thousand species of them live inside us, on our skin, and on our very eyelashes. Yet we have now significantly reduced their power and in doing so have sparked an epidemic of noncommunicable diseases—which now account for 63 percent of all human deaths. Ultimately, this book is not just about microbes; it is about a different way to view humans. The story that Dietert tells of where the new biology comes from, how it works, and the ways in which it affects your life is fascinating, authoritative, and revolutionary. Dietert identifies foods that best serve you, the superorganism; not new fad foods but ancient foods that have made sense for millennia. He explains protective measures against unsafe chemicals and drugs. He offers an empowering self-care guide and the blueprint for a revolution in public health. We are not what we have been taught. Each of us is a superorganism. The best path to a healthy life is through recognizing that profound truth.

Medical and Health Genomics provides concise and evidence-based technical and practical information on the applied and translational aspects of genome sciences and the technologies related to non-clinical medicine and public health. Coverage is based on evolving paradigms of genomic medicine—in particular, the relation to public and population health genomics now being rapidly incorporated in health management and administration, with further implications for clinical population and disease management. Provides extensive coverage of the emergent field of health genomics and its huge relevance to healthcare management Presents user-friendly language accompanied by explanatory diagrams, figures, and many references for further study Covers the applied, but non-clinical, sciences across disease discovery, genetic analysis, genetic screening, and prevention and management Details the impact of clinical genomics across a diverse array of public and community health issues, and within a variety of global healthcare systems

Suddenly, research findings require a paradigm shift in our view of the microbial world. The Human Microbiome Project at the National Institutes of Health is well under way, and unprecedented scientific technology now allows the censusing of trillions of microbes inside and on our bodies as well as in the places where we live, work, and play. This intriguing, up-to-the-minute book for scientists and nonscientists alike explains what researchers are discovering about the microbe world and what the implications are for modern science and medicine. Rob DeSalle and Susan Perkins illuminate the long, intertwined evolution of humans and microbes. They discuss how novel DNA sequencing has shed entirely new light on the complexity of microbe-human interactions, and they examine the potential benefits to human health: amazing possibilities for pinpoint treatment of infections and other illnesses without upsetting the vital balance of an individual microbiome. This book has been inspired by an exhibition, The Secret World Inside You: The Microbiome, at the American Museum of Natural History, which will open in New York in early November 2015 and run until August 2016. It will then travel to other museums in the United States and abroad.

Apples, blueberries, peppers, cucumbers, coffee, and vanilla. Do you like to eat and drink? Then you might want to thank a bee. Bees pollinate 75 percent of the fruits, vegetables, and nuts grown in the United States. Around the world, bees pollinate $24 billion worth of crops each year. Without bees, humans would face a drastically reduced diet. We need bees to grow the foods that keep us healthy. But numbers of bees are falling, and that has scientists alarmed. What's causing the decline? Diseases, pesticides, climate change, and loss of habitat are all threatening bee populations. Some bee species teeter on the brink of extinction. Learn about the many bee species on Earth—their nests, their colonies, their life cycles, and their vital connection to flowering plants. Most importantly, find out how you can help these important pollinators. "If we had to try and do what bees do on a daily basis, if we had to come out here and hand pollinate all of our native plants and our agricultural plants, there is physically no way we could do it. . . . Our best bet is to conserve our native bees." —ecologist Rebecca Irwin, North Carolina State University

Pocket Anatomy & Physiology

Pleased to Meet Me

Human Microbes - The Power Within

Where Have All the Bees Gone?

Getting to Know the Trillions of Bacteria and Other Microbes In, On, and Around You

Workshop Summary

Gut Feelings

This is the only book that tells both sides of the story of germs: that they are critically important for our health and that the dangers of emerging pathogens continue to wreak havoc in our bodies and around the world. With straight-forward and engaging writing, infectious diseases physician Phillip Peterson surveys how our understanding of viruses has changed throughout history, from early plagues and pandemics to more recent outbreaks like HIV/AIDS, Ebola, Zika, and Coronavirus. Microbes also takes on contemporary issues like the importance of vaccinations in the face of the growing anti-vaxxer movement, as well as the rise of cutting-edge health treatments like fecal transplants. Peterson relays his first-hand experience dealing with an unprecedented emergence of new microbial threats. Yet at the same time he has witnessed the astounding recent discoveries of the crucial role of the microbes that colonize our body surfaces in human health. Microbes explains for general readers where these germs came from, what they do to and for us, and what can be done to stop the bad actors and foster the benefactors.

These two volumes constitute the Proceedings of the 7th International Workshop on Soft Computing Applications (SOFA 2016), held on 24–26 August 2016 in Arad, Romania. This edition was organized by Aurel Vlaicu University of Arad, Romania, University of Belgrade, Serbia, in conjunction with the Institute of Computer Science, Iasi Branch of the Romanian Academy, IEEE Romanian Section, Romanian Society of Control Engineering and Technical Informatics (SRAIT) - Arad Section, General Association of Engineers in Romania - Arad Section, and BTM Resources Arad. The soft computing concept was introduced by Lotfi Zadeh in 1991 and serves to highli ght the emergence of computing methodologies in which the accent is on exploiting the tolerance for imprecision and uncertainty to achieve tractability, robustness and lower costs. Soft computing facilitates the combined use of fuzzy logic, neurocomputing, evolutionary computing and probabilistic computing, leading to the concept of hybrid intelligent systems. The rapid emergence of new tools and applications calls for a synergy of scientific and technological disciplines in order to reveal the great potential of soft computing in all domains. The conference papers included in these proceedings, published post-conference, were grouped into the following areas of research: • Methods and Applications in Electrical Engineering • Knowledge-Based Technologies for Web Applications, Cloud Computing, Security Algorithms and Computer Networks • Biomedical Applications • Image, Text and Signal Processing • Machine Learning and Applications • &nb sp; Business Process Management • Fuzzy Applications, Theory and Fuzzy Control • Computational Intelligence in Education • Soft Computing & Fuzzy Logic i n Biometrics (SCFLB) • Soft Computing Algorithms Applied in Economy, Industry and Communication Technology • Modelling and Applications in Textiles The book helps to disseminate advances in selected active research directions in the field of soft computing, along with current issues and applications of related topics. As such, it provides valuable information for professors, researchers and graduate students in the area of soft computing techniques and applications.

The author of Gutbliss and one of today’s preeminent gastroenterologists distils the latest research on the microbiome into a practical program for boosting overall health. The microbiome — the collective name for the trillions of bacteria that live in our gut — is today’s hottest medical topic. Synthesising the latest findings, Dr Robynne Chutkan explains how the standard Western diet and lifestyle are starving our microbiome, depleting the ‘good bugs’ that keep us healthy, and encouraging overgrowth of exactly the wrong type of bacteria. The resulting imbalance makes us more prone to disease and obesity, and negatively affects our cravings, our immunity, and even our genes. But beyond the science, what sets The Microbiome Solution apart is Dr Chutkan’s powerful plan for optimising your wellbeing. Discover how our hyper-hygienic lifestyle, enforced with hand-sanitising gels and antibiotics, is stripping our bodies of their natural protective systems; learn about essential prebiotics and probiotics; read a private introduction to the stool transplant, the radical super-fix for a severe microbial imbalance; and cook for thousands of billions with recipes that replenish your microbiome. This book will bring welcome relief to the many millions worldwide who need to grow a good ‘gut garden’ — and enjoy healthier, happier lives. PRAISE FOR ROBYNNE CHUTKAN ‘A thoughtful approach to health and wellness.’ —The Sunday Express ‘Gastroenterologist Chutkan (Gutbliss) makes a strongly argued proposal that people should “live dirty” and “eat clean” ... A thoughtful approach to health and wellness that’s well worth the time of readers.’—Publishers Weekly

The groundbreaking program that connects the microbiome and gut health to healthy weight loss, complete with a 3-phase plan and recipes Cutting-edge science has shown that the microbiome is the key to overall mental and physical health--and the secret behind healthy, sustainable weight loss. Drawing on nearly two decades of experience as a specialist in functional medicine and intestinal health, Dr. Raphael Kellman has developed the first diet based on these scientific breakthroughs. Offering a proven program to heal your gut and reset your metabolism, along with meal plans and 50 delicious chef-created recipes, The Microbiome Diet is the key to safe, sustainable weight loss and a lifetime of good health. "Dr. Kellman masterfully presents a life enhancing, actionable plan based on this emerging science in a way that is user-friendly, for all of us." --Dr. David Perlmutter, New York Times bestselling author of Grain Brain

Probiotics and Prebiotics in Human Nutrition and Health

Health and Survival in a Bacterial World

Medical and Health Genomics

The Human Microbiome, An Issue of Clinics in Laboratory Medicine,

The Germ Code