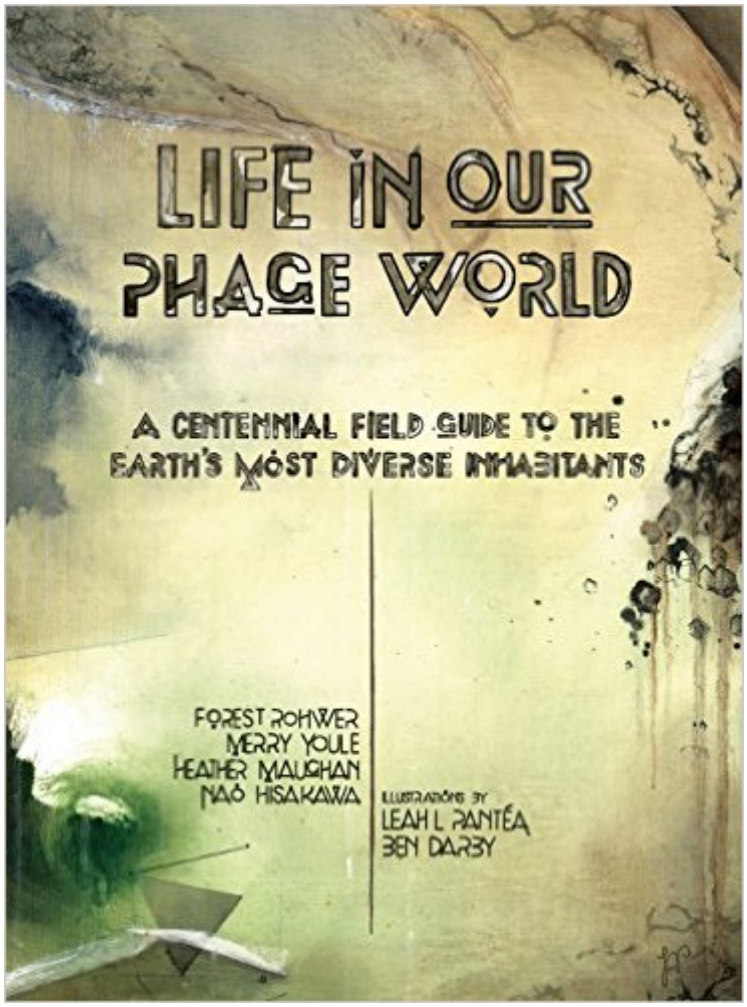
Life In Our Phage World



Synopsis

We share the Earth with more than 10,000,000,000,000,000,000,000,000,000,000 phages. Everywhere they thrive, from well-fed guts to near-boiling acidic springs, from cryoconite holes to endolithic fissures. They travel from one microbial host to the next as virions, their genetic weapons packaged inside a protective protein shell. If you could lay all of these nanoscopic phage virions side-by-side, the line-up would stretch over 42 million light years. Through their daily shenanigans they kill or collaborate with their microbial hosts to spur microbial evolution and maintain ecosystem functioning. We have learned much about them since their discovery by Frederick Twort a century ago. They also taught us that DNA, not protein, is the hereditary material, unraveled the triplet genetic code, and offered their enzymes as indispensible tools for the molecular biology revolution. More contributions will be forthcoming since the vast majority of phages await discovery. Phage genomes harbor the world's largest cache of unexplored genetic diversity, and we now have the equipment needed to go prospecting. Although there are field guides to birds, insects, wild flowers, even Bacteria, there was no such handbook to guide the phage explorer. Forest Rohwer decided to correct this oversight, for novice and expert alike, and thus was born Life in Our Phage World. A diverse collection of 30 phages are featured. Each phage is characterized by its distinctive traits, including details about its genome, habitat, lifestyle, global range, and close relatives. The beauty of its intricate virion is captured in a pen-and-ink portrait by artist Benjamin Darby. Each phage also stars in a carefully researched action story relating how that phage encounters, exploits, kills, or otherwise manipulates its host. These behaviors are imaginatively illustrated by fine artist Leah L. PantÃ©a. Eight researchers that work closely with phages also relate their experiences as inhabitants of the phage world.Â Rohwer has years of first-hand experience with the phage multitudes in ecosystems ranging from coral reefs to the human lung to arctic waters. He pioneered the key metagenomic methods now widely used to catalog and characterize Earth's microbial and viral life. Despite research advances, most people, many scientists included, remain unaware of the ongoing drama in our phage world. In anticipation of 2015, the centennial of phage discovery, Forest assembled a cadre of writers, artists, scientists, and a cartographer and set them to work. The result? This alluring field guide-a feast for the imagination and a celebration of phage diversity. Please see Forest Rohwer's website for additional information about this book.

Book Information

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Customer Reviews

The year 2015 celebrates the centenary of the first documentation of phages by Frederick W. Twort. Since then, however, phages (the viruses that infect bacteria) have often been ignored, discounted and underestimated. Forest Rohwer and his distinguished co-authors now address this glaring omission. A centennial field guide to the most abundant biological entities in the world has been missing until today. In the tradition of other field guides the authors include a global map showing the known geographic range of each featured phage as well as its habitats. Additionally, phage genomes are represented by two versions. First, an artist-created overview of the variety of genome structures of phages when travelling between virion and host (e.g., linear or circular, single-stranded or double-stranded, sticky ends, direct or inverted terminal repeat nucleotide syntax). Second, a detailed genome map allows the reader to follow each gene, finding information about its function, its homology with other page genes and the localisation of its protein product. With this field guide a second century of phage study has begun.BacteriophagesA bacteriophage is a virus that infects and replicates within a bacterium only. There are 10(31) phage virions on earth. This is ten times more than all cells that constitute cellular organisms. Every second, 10(24) phage infections occur on this planet, whereas lytic infection by a single phage yields 20 to 400 progeny per infectious cycle. In the human gut we can find 10(16) phage virions. Together there are 4 million families of viral proteins on earth. If all 1031 phage virions were placed side by side they would stretch to 42 million light years! The book heralds a second century on phage research, but under very different circumstances.

Life in Our Phage World Antibody Phage Display: Methods and Protocols (Methods in Molecular Biology) The Cult of the Amateur: How blogs, MySpace, YouTube, and the rest of today's

user-generated media are destroying our economy, our culture, and our values Our Story: 77 Hours That Tested Our Friendship and Our Faith Modified: GMOs and the Threat to Our Food, Our Land, Our Future Vaccine Epidemic: How Corporate Greed, Biased Science, and Coercive Government Threaten Our Human Rights, Our Health, and Our Children The Story of Stuff: How Our Obsession with Stuff Is Trashing the Planet, Our Communities, and Our Health-and a Vision for Change Toxin Toxout: Getting Harmful Chemicals Out of Our Bodies and Our World Life Coaching: Life Coaching Blueprint: Save A Life One Person At A Time (BONUS 30MINUTE Life Coaching Session- How To Motivate, Inspire, Change Your Life) Dataclysm: Love, Sex, Race, and Identity--What Our Online Lives Tell Us about Our Offline Selves VIETNAMESE VEGETARIAN FOOD - OUR FAMILY VEGETARIAN RECIPES: VEGETARIAN FOOD RECIPES FROM OUR VIETNAMESE HOME - VEGETARIAN FOOD RECIPES VEGAN RECIPES ASIAN ... RECIPES ASIAN VEGAN SERIES Book 1) The Yellow Door: Our Story, Our Recipes Polish Chicago: Our History, Our Recipes Our Honeymoon: A Record Book of Our Getaway Our Stolen Future: Are We Threatening Our Fertility, Intelligence, and Survival?--A Scientific Detective Story The Global Achievement Gap: Why Even Our Best Schools Don’t Teach the New Survival Skills Our Children Need—and What We Can Do About It Human Transit: How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives The Crazy Makers: How the Food Industry Is Destroying Our Brains and Harming Our Children Our Votes, Our Guns: Robert Mugabe and the Tragedy of Zimbabwe Our Guerrillas, Our Sidewalks: A Journey into the Violence of Colombia