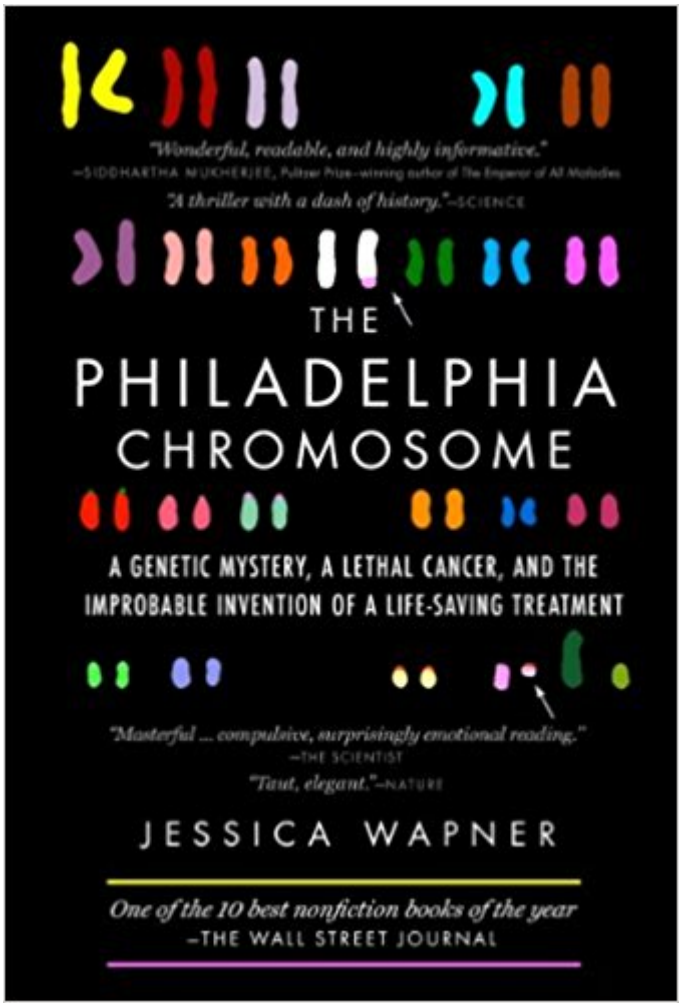
The Philadelphia Chromosome: A Genetic Mystery, A Lethal Cancer, And The Improbable Invention Of A Lifesaving Treatment



Synopsis

Philadelphia, 1959: A scientist scrutinizing a single human cell under a microscope detects a missing piece of DNA. That scientist, David Hungerford, had no way of knowing that he had stumbled upon the starting point of modern cancer researchÃ¢â ¬â ¢ the Philadelphia chromosome. It would take doctors and researchers around the world more than three decades to unravel the implications of this landmark discovery. In 1990, the Philadelphia chromosome was recognized as the sole cause of a deadly blood cancer, chronic myeloid leukemia, or CML. Cancer research would never be the same.Science journalist Jessica Wapner reconstructs more than forty years of crucial breakthroughs, clearly explains the science behind them, and pays tributeÃ¢â ¬â ¢with extensive original reporting, including more than thirty-five interviewsÃ¢â ¬â ¢to the dozens of researchers, doctors, and patients with a direct role in this inspirational story. Their curiosity and determination would ultimately lead to a lifesaving treatment unlike anything before it.The Philadelphia Chromosome chronicles the remarkable change of fortune for the more than 70,000 people worldwide who are diagnosed with CML each year. It is a celebration of a rare triumph in the battle against cancer and a blueprint for future research, as doctors and scientists race to uncover and treat the genetic roots of a wide range of cancers.

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Customer Reviews

Chronic myelogenous leukemia (CML) is an uncommon but fatal cancer. More than 95 percent of patients afflicted with this malignancy have a chromosomal abnormality known as the Philadelphia chromosome. This genetic mutation is characterized by a swap of genetic matter between two

different chromosomes so that a single chromosome (number 22) has a piece missing. The mutated chromosome codes for an enzymeÃ¢â ¬â •tyrosine kinaseÃ¢â ¬â •that is hyperactive and ramps up production of white blood cells that leads to leukemia. A chemical compound was identified that selectively targets the kinase protein. Gleevec was FDA approved in 2001, and the results have been quite impressive. It outperformed the existing first-line treatment for CML. It is safer than a bone marrow transplant. Gleevec is unique among cancer drugs because it is taken orally (instead of administered intravenously) at home (instead of the hospital or clinic) with very manageable side effects. Science writer Wapner has pieced together a detailed account of a spectacular scientific success story and a turning point in the treatment of cancer. --Tony Miksanek --This text refers to an out of print or unavailable edition of this title.

One of The Wall Street Journal's 10 Best Nonfiction Books of 2013: Ã¢â ¬Å“There were numerous strong books about cancer in 2013, but this account of the decades of work to find a drug to fight chronic myelogenous leukemia was the strongest. Jessica Wapner translates the complexities of medical science for the general reader and demonstrates the necessity of collaboration between two traditional enemies, academia and Big Pharma.Ã¢â ¬Â• Ã¢â ¬Å“Among a small cluster of very good recent books on cancer.Ã¢â ¬Â• Ã¢â ¬â •The New York Times Ã¢â ¬Å“This reporting takes in a huge swath of science and research, a landscape that changes dramatically over the course of her story. WapnerÃ¢â ¬â„¢s achievement is to help the reader understand why each development is huge in its time and placeÃ¢â ¬â •starting with Hungerford peering through his camera at the chromosomes and following scientists through the laboratory stories, through drug development and animal testing, to the triumphant patient treatment when the drug becomes almost routineÃ¢â ¬â •a scientific miracle absorbed into the daily lives of a group of patients no longer united by a fatal diagnosis.Ã¢â ¬Â• Ã¢â ¬â •The Washington Post Ã¢â ¬Å“In [The Philadelphia Chromosome], Jessica Wapner chronicles the ensuing decades of laborious scientific inquiry and industrial ingenuity that led to the discovery of Gleevec, the first drug designed to attack cancer at the genetic level. Its success in beating CML into remission and making the errant chromosome disappear has helped to revolutionize cancer research, unleashing a hunt for the genetic basis of other cancers and opening the door to comparable targeted treatments.Ã¢â ¬Â• Ã¢â ¬â •The Wall Street Journal Ã¢â ¬Å“[A]Ã Â riveting suspense story . . . Ten years ago, CML was a death sentence. Today, with Gleevec, most of its sufferers lead full and normal lives. Wapner tells the complex story of how this came to be with clarity, eloquence, and balanced insight.Ã¢â ¬Â• Ã¢â ¬â •American Scholar Ã¢â ¬Å“An excellent book for those who want

to learn more about how medical discoveries are made and those interested in recent medical history, as well as those whose lives are affected by CML.Ã¢â ¬Â• Ã¢â ¬â •Library Journal Ã¢â ¬Å“A crucial link between genetics and cancer emerged in a US lab in 1959, as researcher David Hungerford peered down a microscope at an abnormally small chromosome. In 1990, this Ã¢â ¬Ëœ‰Philadelphia chromosomeÃ¢â ¬â„¢ was found to cause the swiftly fatal chronic myeloid leukaemia. As science writer Jessica Wapner reveals in this taut, elegant study, a cascade of breakthroughs then led to success with targeted drug Gleevec, a tyrosine kinase inhibitorÃ¢â ¬â •and hopes for the cancer-busting potential of rational drug design in general.Ã¢â ¬Â• Ã¢â ¬â •Nature Ã¢â ¬Å“[T]he way Wapner repeatedly adds up preceding steps to build to the scientific breakthrough is masterful, making for compulsive, surprisingly emotional reading." Ã¢â ¬â •The Scientist Ã¢â ¬Å“A thriller with a dash of history.Ã¢â ¬Â•Ã¢â ¬â •Science Ã¢â ¬Å“In this meticulously detailed chronicle, science writer Wapner recaps the remarkable development of Gleevec, a cutting-edge drug capable of beating the typically fatal cancer of white blood cells known as chronic myeloid leukemia (CML). . . . Her gracefully written history skillfully combines both the science and humanity of this fascinating search for a cure for CML.Ã¢â ¬Â• Ã¢â ¬â •Publishers Weekly Ã¢â ¬Å“Wapner weaves together the basic and applied science with the stories of the dedicated researchers, the broader supporting superstructure of modern medicine and the process of bringing pharmaceuticals to market. . . . An absorbing, complex medical detective story.Ã¢â ¬Â• Ã¢â ¬â •Kirkus Reviews Ã¢â ¬Å“Expounding the well-known link between genetics and cancer, this scientific history recounts the initial discovery of a gene mutation that eventually led to enormous breakthroughs in the fight against leukemia.Ã¢â ¬Â• Ã¢â ¬â •The Barnes & Noble Review Ã¢â ¬Å“Jessica Wapner reveals how the discovery of a single mutated chromosome led to a trailblazing treatment for leukemia and a variety of other cancers.Ã¢â ¬Â• Ã¢â ¬â •Shelf Awareness Ã¢â ¬Å“Splendidly written in the tradition of the legendary medical book, Microbe Hunters, this book proves that medical science is as cool as those forensic shows like CSI.Ã¢â ¬Â• Ã¢â ¬â •Philadelphia Weekly Ã¢â ¬Å“I would enthusiastically recommend [this book] to the lay public, people living with cancer and cancer researchers. . . .[T]he story of the Philadelphia chromosomeÃ¢â ¬â •the scientific creativity and the dedication it celebrates and the medical scientific triumph it representsÃ¢â ¬â •is one that deserves to be cherished for eternity.Ã¢â ¬Â• Ã¢â ¬â •Nature Medicine Ã¢â ¬Å“[The Philadelphia Chromosome] opens our eyes to a future in which remedies will kill tumors at their root.Ã¢â ¬Â•Ã¢â ¬â •Philadelphia Inquirer Ã¢â ¬Å“[C]hronicles the decades-long quest to develop a targeted, or Ã¢â ¬Ëœrational,Ã¢â ¬â„¢ treatment that would attack cancer on the genetic level.Ã¢â ¬Â• Ã¢â ¬â •New York Post Ã¢â ¬Å“I

enjoyed the book immensely for its enthusiasm, compassion, and depth, while remaining accessible to those not versed in science. It should become a classic.Ã¢â ¬Â• Ã¢â ¬â •Helen Lawce, Journal of the Association of Genetic Technologists Ã¢â ¬Å“The story of the Philadelphia chromosome is truly the story of modern cancer biologyÃ¢â ¬â •from the very earliest description of a chromosomal abnormality in cancer cells to the development of a targeted medicine against a formerly lethal type of leukemia. Jessica Wapner stitches the whole story together with tenacity, diligence (and humor). This is a wonderful, readable, and highly informative book.Ã¢â ¬Â• Ã¢â ¬â •Siddhartha Mukherjee, Pulitzer PrizeÃ¢â ¬â œwinning author of The Emperor of All Maladies Ã¢â ¬Å“Jessica Wapner shows us in The Philadelphia Chromosome how the past and the future combine to dramatically change the course of a disease. This beautifully written book is a blueprint for broader healthcare change. A pivotal book.Ã¢â ¬Â• Ã¢â ¬â •David B. Agus, MD, Professor of Medicine and Engineering, University of Southern California, and author of The End of Illness Ã¢â ¬Å“Jessica Wapner has done two kinds of hard work gracefully: the hard work of understanding cancer genetics and the hard work of rendering that subject into human narrative, lucid explanation, and metaphor. The Philadelphia Chromosome is not just an urgently useful book. It's also an elegant one, put together like a Swiss watch.Ã¢â ¬Â• Ã¢â ¬â •David Quammen, author of Spillover: Animal Infections and the Next Human Pandemic Ã¢â ¬Å“The Philadelphia Chromosome clearly explains how a half-centuryÃ¢â ¬â„¢s worth of research transformed a viciously lethal form of cancer into a chronic, treatable condition. Jessica WapnerÃ¢â ¬â„¢s meticulously researched book is both a real-life medical thriller and an engaging narrative about the history of modern cancer research.Ã¢â ¬Â• Ã¢â ¬â •Seth Mnookin, author of The Panic Virus: The True Story Behind the Vaccine-Autism Controversy

This book was well written and understandable to a non-scientist, such as myself. That is not to say, however, that I wasn't sometimes confused about how all the different people whose discoveries came together to lead to the discovery of Gleevec fit together. The author jumps back and forth a bit and there were a lot of names and patients to keep track of, and I had to stop and try to recall who we were talking about. And I'm not a biochemist and since my chemistry in high school days are long gone, I had to look up a bunch on wikipedia to refresh my recollection of cellular processes. Although, I'm not saying that this book isn't well written. Far from it. The author uses good analogies to help the reader understand the cellular processes. Without that help, I would have been lost.The Philadelphia chromosome has had an unfortunate effect on my family. I have had a 3rd cousin die from leukemia who had received a bone marrow transplant, a first cousin die from cml with the

philadelphia chromosome, and a nephew with ALL with the philadelphia chromosome survive because he got to take Gleevec. My first cousin with CML went into blast stage a short couple of months after Gleevec was featured on the news and he was unable to get the medicine that would have saved his life. So, this topic is very real and personal one to me and this book helped me to understand the process of the disease and the miracle of the discovery this book speaks of. I just wish the 3 years of stalling on the beginning of trials had not existed, because those were the 3 years that my cousin could have got on the trial and lived. He left four children and a wife. He was the sole support and comfort of his family. I miss him.

This is a well written book which I listened to as an audio book. It is difficult to write about history when many of the principals are still alive, in this case as still active as basic science and clinical science researchers. However Ms. Wapner gets it right regarding the history of chronic myeloid leukemia (CML) from the first discovery of the "Philadelphia chromosome" at Fox Chase Cancer Center and the University of Pennsylania by Hungerford and Nowell. Janet Rowley at the University of Chicago made the seminal discovery that chromosomes 9 and 22 had exchanged genetic information leading to the development of CML. There are many individuals who are acknowledged as important to the understanding of how this cancer develops and the successful treatment that has turned a life threatening disease into a chronic one. In particular Ms. Wapner discusses the importance of Tony Hunter who first described the phosphorylation of tyrosine leading to intracellular activation depending on the protein undergoing phosphorylation. It is Brian Drucker who is the driving force behind the clinical trial to treat CML patients with imatinib. Despite reluctance on the part of Ciba Geigy and later Novartis, Drucker leads the clinical trials of the drug developed by Nick Lydon and colleagues at Ciba Geigy. Thus a large cast of individuals were responsible for this drug being available to treat CML, some acute leukemia patients and those for gastrointestinal stromal tumor. When the Nobel Prize is awarded for this discovery, it will be difficult to pick the other two individuals who deserve this honor after Brian Drucker.

This is a well written book that starts with cytogenetic discovery of Philadelphia chromosome and its subsequent realization that it was actually a translocation. The identification of the molecular alteration, involving the convergence of many scientific areas and scientific personalities gives an example of how scientific discoveries are made in he real world. Search for a marketable drug, obviously requiring the cooperation of for-profit organizations, clearly requires champions who believe that a drug can be made, particularly at a time when there is no evidence that such a drug

can be made, much less marketed. These travails have been discussed well and should help understand some of the dynamics of drug discovery. I would have liked a little more discussion of the responses of early/late stage CML to the drug. Finally, I would have liked if the author mentioned how drug discovery and drug resistance are closely intertwined and mentioned the complex question of discovering and developing/pricing of targeted drugs for any therapy with the ongoing discoveries.

This book describes the investigation of the first known cancer of genetic origin, by Dr. Brian Druker, and how his laboratory ended up at Oregon Health Science University (OHSU) after being rejected by all other major medical research centers. He found that CML Leukemia is blocked by a specific antibody (CGP-57148B) that blocks cancerous growth, and he tested this drug on his patients in cooperation with FDA protocals.Dr. Druker is unique, both as a researcher and clinician. Because most researchers are not MDs, they do not have the humanity of a clinician. That is why Dr. Druker is loved by his patients, as well as by the author. Still the book gives recognition to perhaps 100 researchers all over the world, who contributed bits to the puzzle of genetic cancer, and this is a major theme of the first half of the book. It was the life tenacity of Dr. Druker and his laboratory that brought this work to fruition.We get lots of books on biochemistry. But the second half of this book is unique in describing how a compound that comes out of research is commercially developed and approved by the FDA, meeting the stringent protocols of dose, safety and cure. While Dr. Druker championed the project, we come to appreciate the problems of the captains of the pharmaceutical industry, who in their way have the same humanitarian objectives. This is an exciting story and , I think, it is the book’s major contribution.

Prevention) Cancer: Coping With Cancer: How To Cope When A Loved One Has Cancer Without Any Grieving (Cancer,Coping With Cancer,Cancer Books,Breast Cancer,Colon Cancer,Lung ... Cure,Prostate Cancer,Cancer Prevention) Alternative Cancer Therapies (Cancer,Cancer Cure,Cancer Diet,Coping With Cancer,Cancer Books,Breast Cancer,Lung Cancer,Cancer Prevention,Colon Cancer) (Alternative Medicine Book 1) The Philadelphia Chromosome: A Mutant Gene and the Quest to Cure Cancer at the Genetic Level Cancer: Taboo Cancer Cures 6 Impressive and Secret Cancer Cures that Most People do not know about (Cancer, Cancer Cures, Yoga, Cancer Treatments, Cancer Medicine, Cancer Patient Book 1) The Philadelphia Inquirer's Walking Tour of Historic Philadelphia (Philadelphia Inquirer's Walking Tours of Historic Philadelphia) Breast Cancer Prevention and Recovery: The Ultimate Guide to Healing, Recovery and Growth: prostate cancer, bone cancer, brain cancer, breast cancer, colorectal, ... cancer killers, cancer is not a disease,) The Cancer Cure Diet: The Complete Cookbook of 20 Cancer Diet Recipes That Work And Why (Cancer Cure, Cancer Nutrition and Healing, Cancer Prevention, ... Cancer Diet Guide, Cancer Recipe Books) Philadelphia 25 Secrets - The Locals Travel Guide For Your Trip to Philadelphia (Pennsylvania - USA): Skip the tourist traps and explore like a local : Where to Go, Eat & Party in Philadelphia 2016 Philadelphia Travel Guide : Miss Passport City Guides Presents Mini 3 Day Unforgettable Vacation Itinerary to Philadelphia (3-Day Budget Itinerary): Philadelphia ... Trip (Miss Passport Travel Guides Book 18) Colon Cancer - A Cancer Prevention and Cancer Cure Guide to Understanding the Facts of Colon Cancer for Treatment, Diet, and Nutrition Winning The Cancer Battle: Nutritional Help for Breast Cancer, Prostate Cancer, Intestinal Cancer, Vaginal Cancer, and Various Other Cancers The Value of Escharotics Medicines Which Will Destroy Any Living or Fungus Tissue in the Treatment of Cancer, Lupus, Sarcoma or Any Other Forms of Malignancy (Spine Title: Cancer: its Proper Treatment At Dr. Nichols Cancer Sanatorim by Escharotic... CANCER PREVENTION: Cancer Factors, Cancer Fighting Foods And How The Spices Turmeric, Ginger And Garlic Can Reduce Cancer Risk (Essential Spices and Herbs Book 4) Anesthesia for Genetic, Metabolic, and Dysmorphic Syndromes of Childhood (Baum, Anesthesia for Genetic, Metabolic, and Dysmorphic Syndromes of Childhood) The Greetings from Somewhere Collection: Mysteries Around the World: The Mystery of the Gold Coin; The Mystery of the Mosaic; The Mystery of the Stolen Painting; The Mystery in the Forbidden City