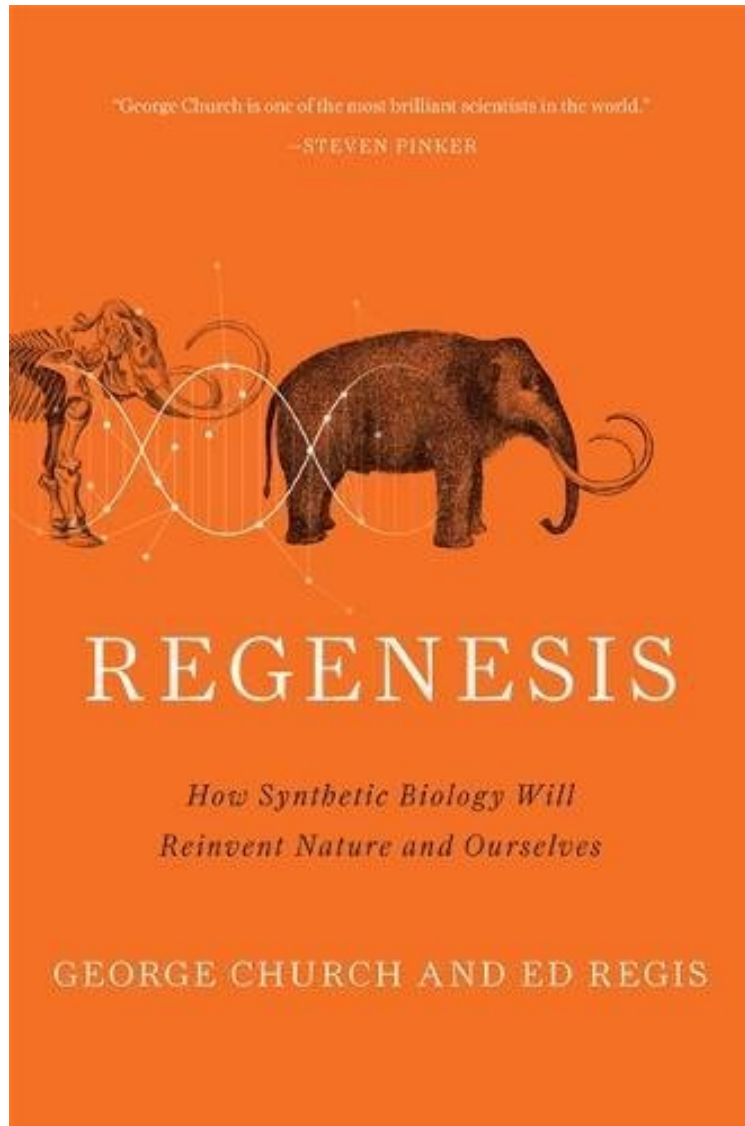


[DOWNLOAD] Regenesi: How Synthetic Biology Will Reinvent Nature and Ourselves

Regenesi: How Synthetic Biology Will Reinvent Nature and Ourselves

George M. Church, Ed Regis
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#133528 in Books George M Church 2014-04-08 2014-04-08Original language:EnglishPDF # 1 9.25 x 1.00 x 6.00l, .84 #File Name: 0465075703304 pagesRegenesi | File size: 18.Mb

George M. Church, Ed Regis : Regenesi: How Synthetic Biology Will Reinvent Nature and Ourselves before purchasing it in order to gage whether or not it would be worth my time, and all praised Regenesi: How Synthetic Biology Will Reinvent Nature and Ourselves:

3 of 3 people found the following review helpful. Science Fiction is Now RealityBy R. BloomA bit of a dense book (which is why I gave it only 4 stars). But if you read it through, a world will open for you. The book is about synthetic

genetics -- how the advances that are happening right now, but especially in the decades to come, will change the world and blow your mind. There is a lot in this book. But I would like to just talk about my favorite part -- the iGEM competition. iGEM is an international student competition for genetic engineering. As Church says [referring to the year 2005], "Undergrads were now doing things, largely in a spirit of fun, that professional molecular biologists would have been hard-pressed to achieve a mere ten years earlier." In the 2007 competition, the team from UC Berkeley engineered *E. coli* to produce a blood substitute that could be freeze-dried and stored, and then could be reconstituted and grown up in large volumes when needed. In 2008, the grand prize winner was a Slovenian team from the University of Ljubljana which created a synthetic vaccine for the bacteria that causes stomach ulcers. In 2006, the same Slovenian team had presented an idea for preventing infection of human cells by HIV. In 2010 the competition had grown from the original four teams (in 2005) to 130 teams from all over the world: Asia (38), Europe (38), the US (37), Canada (10), Latin America (4) and Africa (1). The ideas presented by these student teams were amazing, inspiring, brilliant. A team from the Swiss Federal Institute of Technology at Lausanne aimed to stop malaria propagation by acting on the vector, that is, the mosquito itself, by coaxing the bacterium that naturally lives in the mosquito's gut to express an immunotoxin that can prevent the malarial agent from infecting the mosquito, thereby eliminating transmission of the parasite to humans. A team from Polytechnic University of Valencia, Spain had a plan to change the climate of Mars (yes, the planet) by building an engineered yeast, resistant to temperature changes and able to produce a dark pigment which will be responsible for a global temperature increase. (They received a gold prize for their efforts). A team from the University of Washington in Seattle were attempting to synthesize antibiotics, starting with Anthrax for the competition. In my view, this is an idea of staggering proportions given the current crisis in antibiotic resistance. (This same team went on to win the North American competition the following year for engineering *E. coli* to produce both diesel fuel and an enzyme to break down gluten in the digestive tract.) Also receiving a gold prize was a team from the Chinese University of Hong Kong for creating a living data storage system. Apparently, you no longer need to rely exclusively on micro-chips anymore to store an absurd amount of data in a small space. And the big winner was once again the team from Slovenia for coming up with an "assembly-line" molecule for DNA engineering. I don't pretend to fully understand it, but Church likens it to the moment in the industrial revolution when standardized nuts and bolts, machine-tools and assembly-line production systems were introduced. There was a time when to build a machine you had to build everything basically from scratch, custom made and hand-tooled. But around the turn of the 18th century a wave of standardized machinery became the norm, accelerating the process of invention and industrialization exponentially. Apparently, the judges thought the "assembly-line" molecule was potentially at that level of importance. Church's larger point here is that we are on the cusp of assembly-line genetic engineering. Expect an explosion in innovation.

0 of 0 people found the following review helpful. Great book for the modern science major with a vested interest in biology. By Lucas Harrell I've met people who really like this book, and people who hate it. I am one of the people who really liked it. This is one of the most interesting science books I've ever read (with my major being molecular and cellular biology). He brought up so many revolutionary, interesting things you can do with synthetic biology, from resurrecting extinct animals like the Pyrenean Ibex, to using *E. coli* to fight cancer. Oh and biobricks. Can't forget biobricks. Or mirror life. I will admit that it is very very long. Not in terms of pages, but in terms of the complexity of his ideas. Nothing in science is simple, and Church knows that. I actually appreciated this. A lot of science books out there dumb it down for the general population, but Church didn't (at least not to the same extent). We me being a researcher, it was really nice.

0 of 0 people found the following review helpful. I love parts of this book. By Diane I love parts of this book, but others are hard to get through. I picked it as a summer book because I am a biotechnology teacher - but it is not a quick read at all. It is good, but not what I envisioned it would be.

Bold and provocative *Regeneration* tells of recent advances that may soon yield endless supplies of renewable energy, increased longevity and the return of long-extinct species. In *Regeneration*, Harvard biologist George Church and science writer Ed Regis explore the possibilities and perils of the emerging field of synthetic biology. Synthetic biology, in which living organisms are selectively altered by modifying substantial portions of their genomes, allows for the creation of entirely new species of organisms. These technologies far from the out-of-control nightmare depicted in science fiction have the power to improve human and animal health, increase our intelligence, enhance our memory, and even extend our life span. A breathtaking look at the potential of this world-changing technology, *Regeneration* is nothing less than a guide to the future of life.

Nathan Myhrvold, Founder and CEO, Intellectual Ventures "A delightfully opinionated, visionary and controversial romp through synthetic biology, which is one of the most important technologies of our time." Eric Topol, Professor of Genomics, The Scripps Research Institute, and author of "The Creative Destruction of Medicine" "Literally reinventing nature could provide solutions to intractable problems with the energy supply, global warming, and human health. In "Regeneration," George Church, a pioneer and pre-eminent force in promoting our ability to "read" DNA sequence, now guides us to the future: "writing" DNA sequence. Teaming up with Ed Regis, Church provides a mind-bending, tour de

force account of how this seventh industrial revolution will take hold, and how ultimately the survival of our planet and the human species may rely upon rewriting the code of life. An enthralling journey into the future--with truly profound implications--that should not be missed." Stewart Brand, author of "Whole Earth Discipline" "Here you will find the bleeding, screaming, thrilling edges of what is becoming possible with genomic engineering, handsomely framed in the fine-grained fundamentals of molecular biology. It is a combination primer and forecast of what is coming in this 'century of biology' from the perspective of a leading pioneer in the science." "Kirkus s" "[An] authoritative, sometimes awe-inspiring book.... A valuable glimpse of science at the edge." "Publishers Weekly" "Exhilarating and scary facts suffuse this book about bioengineering by leading Harvard genetics professor and entrepreneur Church.... [W]hen Church describes current work building microbes with minimal genes, the book takes off - and eventually soars.... [A] stimulating book." Steven Pinker, Harvard College Professor of Psychology, Harvard University, and author of "How the Mind Works "and "The Better Angels of Our Nature" "A thoughtful introduction to one of the great frontiers of science, o" "New Scientist" "Bold and provocative... Church and Regis offer a behind-the-scenes look at synthetic biology, a rapidly emerging field that is reprogramming the genetic code to create organisms and functions not found in nature. "Regenesis" tells of recent advances that may soon yield endless supplies of renewable energy, increased longevity and the return of long-extinct species." Nathan Myhrvold, Founder and CEO, Intellectual Ventures "A delightfully opinionated, visionary and controversial romp through synthetic biology, which is one of the most important technologies of our time." Eric Topol, Professor of Genomics, The Scripps Research Institute, and author of "The Creative Destruction of Medicine" "Literally reinventing nature could provide solutions to intractable problems with the energy supply, global warming, and human health. In "Regenesis," George Church, a pioneer and pre-eminent force in promoting our ability to "read" DNA sequence, now guides us to the future: "writing" DNA sequence. Teaming up with Ed Regis, Church provides a mind-bending, tour de force account of how this seventh industrial revolution will take hold, and how ultimately the survival of our planet and the human species may rely upon rewriting the code of life. An enthralling journey into the future--with truly profound implications--that should not be missed." 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Church and Regis offer a behind-the-scenes look at synthetic biology, a rapidly emerging field that is reprogramming the genetic code to create organisms and functions not found in nature. "Regenesis" tells of recent advances that may soon yield endless supplies of renewable energy, increased longevity and the return of long-extinct species." "Nature" "The life sciences emerge as the new high-tech in this paean to synthetic biology.... Each step in the genome's evolution serves as a springboard for expositions of how synthetic biology will revolutionize renewable energy, multivirus resistance, and more." Mike Loukides, "O'Reilly Radar" "If there's one book that can turn this movement into a full-blown revolution, this is it." Derek Jacoby, "O'Reilly Radar" "George Church and Ed Regis pull off an exciting and speculative romp through the field of synthetic biology and where it could take us in the not too distant future.... "Regenesis" provides an accessible and engaging introduction to the revolutionary potentials of synthetic biology and should be of interest to both experts and a general science audience." "The Scientist" "[A]n important and surprisingly accessible book, magisterially structured to intertwine the accelerated history of synthetic biology with its precedents in humanity's earlier technological revolutions and in the epochal evolution of life itself. The book packs in a superb short course on life's molecular workings, enabling the reader to grasp how we can actually contemplate resurrecting mammoths and Neanderthals, brewing biofuel from seawater and sunlight, engineering total immunity to vir" "Science News" "Reading the first book penned by Church, a Harvard biologist and polymath, is like falling down a rabbit hole straight into his fermenting brain. Church's wide-ranging career includes developing novel methods for reading the genetic instruction manual, or genome, of creatures from bacteria to humans. Now he focuses on synthesizing those instructions from scratch.... [A] dizzying survey of how scientists have unearthed the secrets of living organisms and are now using that information to revamp life itself." Robert T. Gonzalez, io9 "[A] phenomenal read." "Wall Street Journal" "A definitive account of the advances and business ventures that define this new science [of synthetic biology].... When history is written centuries from now, it is more likely that writing DNA will be the most enduring innovation [of our age]." "New Scientist" "Bold and provocative... Church and Regis offer a behind-the-scenes look at synthetic biology, a rapidly emerging field that is reprogramming the genetic code to create organisms and functions not found in nature. 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