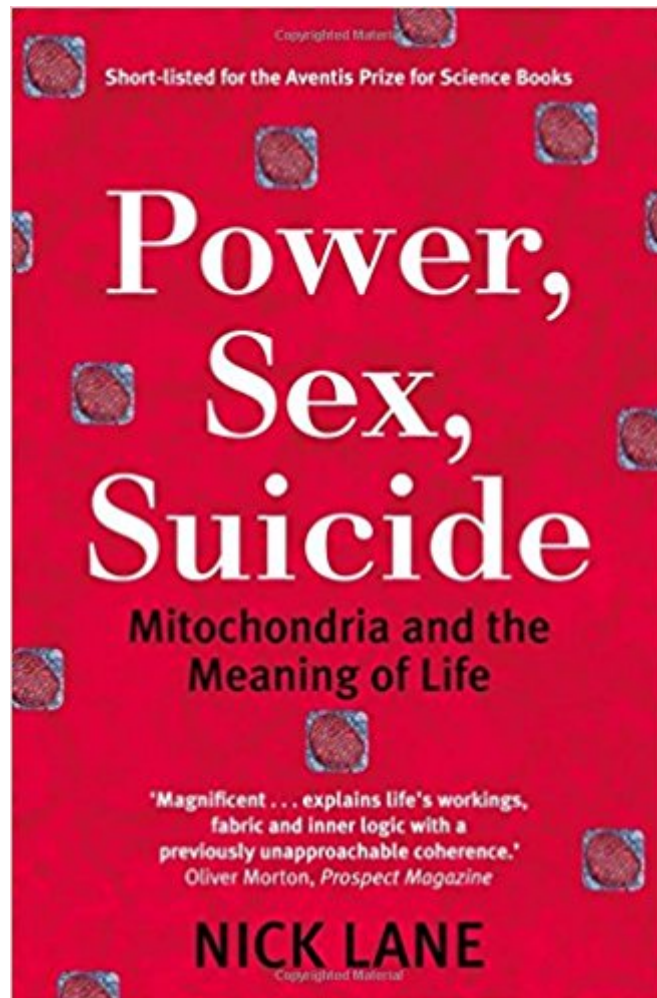




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# Power, Sex, Suicide: Mitochondria And The Meaning Of Life



## Synopsis

If it weren't for mitochondria, scientists argue, we'd all still be single-celled bacteria. Indeed, these tiny structures inside our cells are important beyond imagining. Without mitochondria, we would have no cell suicide, no sculpting of embryonic shape, no sexes, no menopause, no aging. In this fascinating and thought-provoking book, Nick Lane brings together the latest research in this exciting field to show how our growing insight into mitochondria has shed light on how complex life evolved, why sex arose (why don't we just bud?), and why we age and die. These findings are of fundamental importance, both in understanding life on Earth, but also in controlling our own illnesses, and delaying our degeneration and death. Readers learn that two billion years ago, mitochondria were probably bacteria living independent lives and that their capture within larger cells was a turning point in the evolution of life, enabling the development of complex organisms. Lane describes how mitochondria have their own DNA and that its genes mutate much faster than those in the nucleus. This high mutation rate lies behind our aging and certain congenital diseases. The latest research suggests that mitochondria play a key role in degenerative diseases such as cancer. We also discover that mitochondrial DNA is passed down almost exclusively via the female line. That's why it has been used by some researchers to trace human ancestry daughter-to-mother, to "Mitochondrial Eve," giving us vital information about our evolutionary history. Written by Nick Lane, a rising star in popular science, *Power, Sex, Suicide* is the first book for general readers on the nature and function of these tiny, yet fascinating structures.

## Book Information

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## Customer Reviews

"Full of startling insights into the nature and evolution of life as we know it."--The Economist

Dr. Nick Lane is an honorary senior research fellow at University College, London. His first book, *Oxygen: the Molecule that made the World*, was published to critical acclaim by Oxford University Press in 2002.

Since the beginning of recorded history one of the most enduring problems faced by scientist and philosophers alike was the origin of life itself. Some thought (and still think) that only some sort of supreme being could be responsible for that first spark of life. Others feel the answer may be rooted in biochemical reactions that occurred in some primeval ocean. In *Power, Sex, Suicide* author Nick Lane, being a biochemist himself, focuses on the scientific side of the argument. It wasn't till the 1840's that the first intercellular structures were observed and later, in 1898, the term "mitochondria" was first coined. So the quest for origins was expanded to include the nucleus, mitochondria and other organelles. Over the intervening years many different scientist have addressed this issue resulting a variety of ideas as to how life got started and then bridged the gap between bacteria and eukaryotic cells. Lane covers many of the theories in some detail, giving the reader an inside look on how science works. Concepts like the Hydrogen hypothesis, the Oxygen Bottleneck and the Last Universal Common Ancestor (LUCA) are just the tip of the iceberg. Proton Pumping is another issue that lies at the heart of the eukaryotic cell. How did that come about and how does it work? Of course the main focus of the book is the Mitochondria: What exactly is it? What is its function? And where did it come from? All present day eukaryotic organisms are related through DNA. But was it always that way? Some scientist think that at first there were many "kinds" of eukaryotes but "ours" was the only one that made it through the Oxygen Bottleneck. Others think the Great Historic Rendezvous between two different prokaryotic cells happened only once and the chance of it ever happening again is virtually nil, and the chance of it happening on another planet is just as remote. And finally, what is the identity of of the two organisms that made this historic joining? Like most science writers, Nick Lane provides his own theories and ideas on the subject, that's why he wrote the book in the first place. You may or may not agree with him on all points but that's what science is all about. At the very least this opens the door to other books and other authors who will give you their take on the Mitochondria and its origin. While Lane does a good job of making this complex subject accessible to the interested layperson there are parts of the book that are somewhat more difficult for the "non chemist" reader. On the whole though, anyone who got through High School Biology and/or Chemistry shouldn't have a problem with this book. Keep in mind that biochemistry is

a fast changing field of research with new findings and new theories popping up all the time. Many of the conclusions reached in this book may have been modified or invalidated in the intervening years since publication. That being said, this is one of the best science books I've ever read so if you're up to the challenge -- go for it. I had no technical or formatting issues with this Kindle edition. LastRanger

Amazing writing and descriptions of complex biological processes. A good read for any bio majors or healthcare folks.

most reviews have been resoundingly positive and i won't deviate from that here. I will say this, I have a degree in chemistry and took biochem in college and found some of the chapters in the first parts of this book fairly advanced. i had to read sections a few times to follow properly. having said that, i think more science books should be written like this. this is at the the opposite end of the spectrum from "a short history of nearly everything" or other general science books. if you're interested in seriously learning about mitochondria, biochemical principles and the origin of life from a chemical standpoint i think nick lane does a great job and I'm very grateful he wrote this.

Dr. Lane takes us on our journey from bacteria and single celled animals to the diverse and exquisite life forms we see today. Our survival and development is mediated by the need to regulate energy production and use.

This is simply a great book overflowing into various readership disciplines. It would be a great read for a biologist, educator, or someone simply interested in science. Lane, if feel, reaches several audiences immediately as bullet points make interesting mitochondrial information available for the general public - for example - when it is stated that 10% of an average humans body weight is comprised of mitochondria, but also gets into depth when addressing mtDNA and the functions of the mitochondria. I have a couple of books looking at the mitochondria, and organelle that is now under the microscope of the international community, and this book is one of the best for a non-specialist with deep interests in cell biology and a readable text. It is very detailed, but novel like. If you are looking for literature on the Mitochondria (or Cell Biology/Histology) it is hard to find better than this as a general easy and informative read.

I really enjoyed this book and lost sleep because I didn't want to stop reading! The author

synthesizes a huge body of scientific work from the past up to the cutting edge and includes his own logic and even conjecture. He brings the reader along so well that at pretty much every point where I had a confusion or complaint, he already had a footnote or paragraph in response. The theory of the origin of eukaryotic cells, and the thorough reconceptualization of the mitochondrial theory of aging, we're particularly interesting for me. I truly learned a lot and will savor and apply the new insights for a long time. Anyone who enjoys Richard Dawkins will enjoy this book too.

Nick Lane artfully communicates difficult concepts in a light and enjoyable way. But more importantly, he assembles decades of research into a vitally important narrative that has huge implications. I applaud Mr. Lane, and thank him for this gift.

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