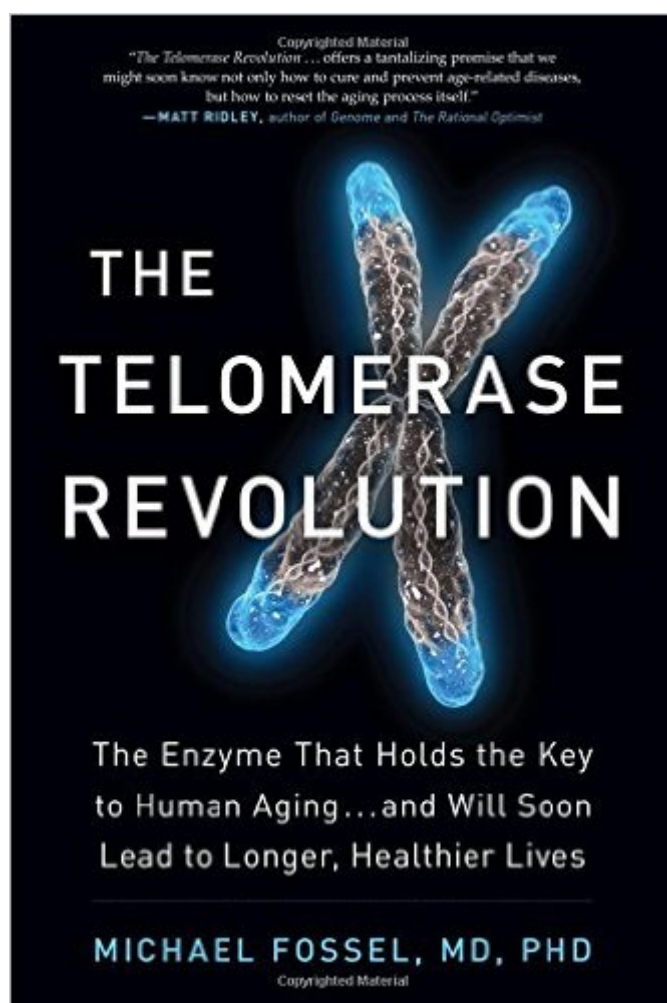


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# The Telomerase Revolution: The Enzyme That Holds The Key To Human Aging—and Will Soon Lead To Longer, Healthier Lives



## Synopsis

One of Wall Street Journal's "Best Books for Science Lovers" in 2015 Science is on the cusp of a revolutionary breakthrough. We now understand more about aging and how to prevent and reverse it than ever before. In recent years, our understanding of the nature of aging has grown exponentially, and dramatic life extension; even age reversal; has moved from science fiction to real possibility. Dr. Michael Fossel has been in the forefront of aging research for decades and is the author of the definitive textbook on human aging. In *The Telomerase Revolution*, he takes us on a detailed but highly accessible scientific journey, providing startling insights into the nature of human aging. Twenty years ago, there was still considerable debate of the nature of human aging, with a variety of competing theories in play. But scientific consensus is forming around the telomere theory of aging. The essence of this theory is that human aging is the result of cellular aging. Every time a cell reproduces, its telomeres (the tips of the chromosomes) shorten. With every shortening of the telomeres, the cell's ability to repair its molecules decreases. It ages. Human aging is the result of the aging of the body's trillions of cells. But some of our cells don't age. Sex cells and stem cells can reproduce indefinitely, without aging, because they create telomerase. Telomerase re-lengthens the telomeres, keeping these cells young. *The Telomerase Revolution* describes how telomerase will soon be used as a powerful therapeutic tool, with the potential to dramatically extend life spans and even reverse human aging. Telomerase-based treatments are already available, and have shown early promise, but much more potent treatments will become available over the next decade. *The Telomerase Revolution* is the definitive work on the latest science on human aging, covering both the theory and the clinical implications. It takes the reader to the forefront of the upcoming revolution in human medicine.

## Book Information

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## Customer Reviews

Today aging is interpreted in two very different ways with many opposing assumptions and implications. The old paradigm defines aging as the cumulative effect of various inevitable degenerative processes that can be mitigated but never completely controlled. The new paradigm considers aging as a physiological phenomenon with specific mechanisms genetically determined and regulated. This, in principle, allows to consider methods that might control aging even completely. The book by Michael Fossel, *The Telomerase Revolution* (BenBella Books, 2015), is clearly on the side of the new paradigm. The book traces, in a simplified way but with many enrichments, the concepts expounded in the well-known authoritative and documented textbook by the same author [1]. It describes, in a popular way, how we age through mechanisms based on the telomere-telomerase system and the consequent progressive decrease both of cell turnover and of cell efficiency. In the arguments of the book, there is also a net distinction between aging and the common diseases caused by wrong lifestyles whose effects increase in proportion to age. While these diseases can be prevented by avoiding incorrect lifestyles, the same measures are totally ineffective to slow down aging. It is also true, however, that erroneous lifestyles both cause distinct diseases and accelerate and complicate aging effects, a common cause of confusion between aging and age-related diseases. Fossel's description of aging mechanisms is linear and consistent and should allow the understanding of complex concepts - some of them in contrast with widespread and accepted ideas - even to those who are not biology scholars or are unfamiliar with the medical or scientific world.

Fossel writes about a simple and speculative idea: cell aging is caused by a shortening of the telomeres (which impacts gene expression) and, in turn, cell aging causes our aging. There is some but overall little evidence in favor of this theory. However, if the theory is even just partially correct, it could have deep consequences. And even if it is wrong, the whole topic is still fascinating. This is an enjoyable book, so I gave 5 stars. It is not a textbook... this is just a fun book to read over the week-end. The author kept jargon to a minimum. He gives all the references supporting his theory, but he does not go into the details of the recent research, presenting instead an overview... As some reviewers have remarked, Fossel gives himself a central role in the story. It is told as a personal

story. It did not bother me. To answer some possible objections...- If this is so promising... why has this not been pursued and completed already? Well. Research on telomerase was granted a Nobel prize, so there has been plenty of research.- But why has this not been pursued more aggressively as a therapy? We have been working for decades on a cure for the HIV virus, and we are not there yet. It is one thing to identify a potential line of attack and quite another to develop and test an actual therapy. You can't eat telomerase and expect it to end up in your genes. There are stories of people who might have undergone gene therapy so that some of their cells produce telomerase. We should not be surprised if such work is not easy to fund and get approved by governmental bodies. But even if the telomere theory is correct...

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