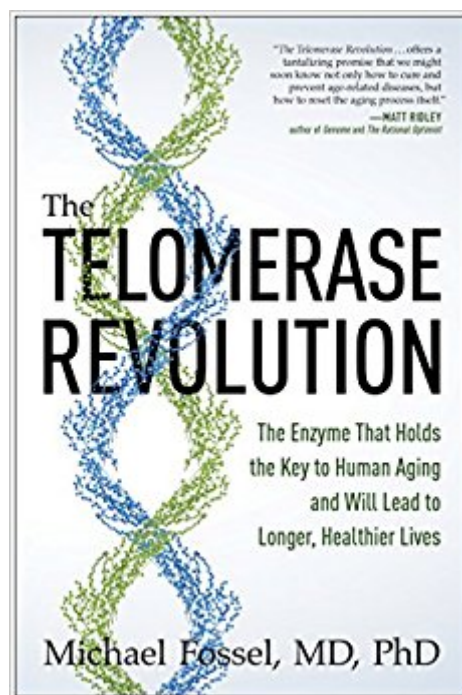




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# The Telomerase Revolution: The Enzyme That Holds The Key To Human Aging And Will Lead To Longer, Healthier Lives



## 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

"The Telomerase Revolution is a remarkable book, telling a fascinating story that pulls together at last a single coherent theory of how and why growing old leads to so many different forms of illness. It also offers a tantalizing promise that we might soon know not only how to cure and prevent age-related diseases, but how to reset the aging process itself. Michael Fossel is a radical optimist."

—Matt Ridley, author of *Genome* and *The Rational Optimist*

"For a more optimistic glimpse of the future, try Michael Fossel's fascinating account of how we might halt and reverse the process of aging. Mr. Fossel argues that the mechanism behind all chronic diseases of old age, even Alzheimer's, lies in the shortening of chromosomal repeats called telomeres. Given that all cells are equipped with a gene capable of preventing that shortening, and some use it, why not try switching that gene on in people's bodies to halt aging? It may not be easy, but it's unlikely to be impossible. Aging might be cured one day."

—The Wall Street Journal

"Telomerase Therapy breaks down centuries of human thought on aging and uproots outdated ideologies that have led to nothing but worthless snake oil products. Dr. Fossel's exciting book is opening doors to extended healthspan that can change human history, and it's all grounded in solid scientific research."

—Noel Patton, founder and chairman of TA Sciences

"Michael Fossel's compelling argument for the telomere approach to reversing aging isn't just worth a look; it's like reading the words of Virgil as he leads us along the mysteries of aging."

—Alexey Olovnikov, PhD, Institute of Biochemical Physics and Russian Academy of Sciences

"Aging is not an irreversible degenerative process, but an epigenetically determined physiological mechanism, which must not be confused with age-related diseases caused by lifestyle choices. Here, we have an effective and clear guide to understand how we get old and how to tame aging in a few years."

—Giacinto Libertini, MD, member of the Italian Society of Evolutionary Biology

"As a follow-up to his previous publications on the subject, Dr. Fossel brings the reader up-to-date on the progress made in understanding the central role of the telomere in aging. . . . Although a couple of decades of effort have ensued and candidate interventions have emerged, there are no strong and clinically proven interventions at the fore; however, Dr. Fossel constructs a very optimistic but realistic view of what may be on horizon to create the Telomerase Revolution."

&#151;Donald K. Ingram, PhD, professor at the Nutritional Neuroscience and Aging Laboratory, Pennington Biomedical Research Center

Dr. Michael Fossel earned both his PhD and MD from Stanford University, where he taught neurobiology and research methods. Winner of a National Science Foundation fellowship, he was a clinical professor of medicine for almost three decades, the executive director of the American Aging Association, and the founding editor of Rejuvenation Research. In 1996, he wrote the first book on the telomerase theory of aging, *Reversing Human Aging*, describing the medical aspects of extending human telomeres, reversing aging, and curing age-related disease. In 2004, he authored the magisterial academic textbook, *Cells, Aging, and Human Disease*, and in 2011, he coauthored *The Immortality Edge*, a bestselling discussion of the potential for extending the human lifespan. He currently teaches *The Biology of Aging* at Grand Valley State University. The world's foremost expert on the clinical use of telomerase for age-related diseases, Michael has lectured at the National Institute for Health and the Smithsonian Institute, and continues to lecture at universities, institutes, and conferences throughout the world. He has appeared on Good Morning America, ABC 20/20, NBC Extra, Fox Network, CNN, BBC, Discovery Channel, and regularly on NPR. He is currently working to bring telomerase to human trials for Alzheimer's disease.

As an aging physician (ophthalmologist) who has been interested in aging, that is, how to delay it, and if possible reverse it, I have studied every claim to these ends and indulged in the few which seemed reasonable. Dr. Fossel, who has written the only medical textbook on cellular aging in existence, explains how telomere loss leads to increasing cellular senescence and eventual death, with the subsequent death of the organism. He cites some lower organisms which never die until eaten because telomeres are maintained. Most significantly, he explains how activation of the dormant gene in our cells for the enzyme which builds telomeres will reverse cellular aging, and therefore prevent a host of degenerate diseases. It has already been done in the lab on tissues and even in some artificially aged lower animals. This book is written for educated laymen as well as physicians. It is to the point, logical, and in my opinion compelling. Very well written. The explanation on how telomere loss leads to specific diseases alone is worth the read. There is even a reasonable speculation of why evolution would 'select' death for all of us individual organisms. This is something to get excited about! It looks like the 'real McCoy' of age reversal! Read it and gain hope!

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 decade 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... these particular therapies might very well fail or prove counterproductive if only because they may fail to elongate telomeres sufficiently. So it is bound to be a difficult road... moreover, as explained by Fossel, researchers are not eager to talk about the idea of reversing aging as it is too much of a disruptive idea. Is the telomere theory correct? We still have too little information to know... But I am not judging the theory, I am judging the book, and it is fun! My only criticism would be that Fossel clearly loses all critical sense toward the end of the book, assuming without restraint that his theory is correct. It would have been more interesting had he spent time reviewing the evidence that is contrary to his theory. I would encourage him to do so in a follow-up edition.

Here's a book that readies you for the future. The author, Michael Fossel, brings credentials and credibility to the task of outlining how current research will deliver human longevity. In a clear, lucid style, the author relates the history, current work, and projected benefits from an enzyme called "telomerase." Normally not produced by mature, differentiated cells, telomerase adds a specific DNA sequence to the ends of a cell's chromosomes, the regions called "telomeres." Once lengthened, the unique happens: cells live longer, easily breaking through the Hayflick Limit, imparting an extended lifespan to the whole organism. I enjoyed how Fossel packs his tome with

facts and references supporting his projection that, within a decade, a viable and inexpensive Fountain of Youth will be found. Get this book. Be prepared.

Dr Fossel takes you on a trip through the evolution of a scientific revolution. He covers many aspect of today's achievements and paints a plausible and positive future for our lives and health.

Telomere extenders have been around for a decade and research is accelerating. Apparently all chronic diseases can be the traced back to aging induced by shortening telomeres.

Great book. I am well educated in the subject of aging but this work gives new thoughts and ideas.

A very no-nonsense informative book. The only viable way to live a long healthy life is by telomerase activation, exercise and a diet that is tailored for you, and by you, on a try and see basis.

Interesting and useful reading

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Longer, and Happier Life 30 Day Cholesterol Cure: Live Longer and Healthier by Lowering Your  
Cholesterol Naturally

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