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THE SECRETS
TO LIVING YOUR
LONGEST,
HEALTHIEST LIFE

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YOUNG FOREVER

Mark Hyman, MD

NEW YORK TIMES BESTSELLING

AUTHOR OF *FOOD*

YOUNG FOREVER

**THE SECRETS TO LIVING YOUR
LONGEST, HEALTHIEST LIFE**

Mark Hyman, MD



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visionaries, and lovers who dare to push the limits of
our imagination and reinvent a better, healthier world
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LITTLE,
BROWN
SPARK

*Do not go gentle into that good night,
Old age should burn and rave at close of day;
Rage, rage against the dying of the light.*

—DYLAN THOMAS

*When you were born you cried and the whole world rejoiced. Live
your life in a way that when you die you rejoice and the whole
world cries.*

—NATIVE AMERICAN PRAYER

*I'm not afraid of death, but I'm in no hurry to die. I have so much I
want to do first.*

—STEPHEN HAWKING

Introduction

If you were asked if you wanted to live to be 120 years old, would you say yes? For most of us, the idea of living beyond our eighties is not appealing. Frailty, decrepitude, dependency, loss of mobility, pain, and disease seem the norm. But is that all inevitable? Is it possible to live into our nineties, hundreds, and beyond disease-free, active, and mentally sharp? The answer emerging from the field of longevity and aging research is a resounding yes! *Young Forever* explores that science but, more importantly, provides a clear road map and practical guide to incorporate the best of the science into a self-care plan that will help you live a healthy and long life.

However, there is a fundamental question you need to answer for yourself before diving into the revolutionary science that can extend both your health span (how many years you live in great health) and your life span (how many years you actually live).

What is your *why*? What matters to you? Why might you want to live to be 100, or even 150 or 200—which is not beyond current scientific possibility?

Much of our lives are spent building, making, and creating. Marriage, children, career, friends, a few vacations. But imagine that you arrive at sixty stronger, fitter, healthier, wiser, smarter, and more energetic than you were at forty? Imagine you have another 60 to 80 years left to live of a vibrant, highly engaged, functional life? What would you do? How would you spend your time? Who would you spend it with? I just turned sixty-three and am stronger and healthier and far wiser than I ever imagined I could be by applying the science of healthy aging to myself. As I look out over the horizon I can now give myself to those things that matter most to me—my family, my friends, teaching, and helping to bring the future of medicine and healing to the world.

For me the answer to *why* is simple: love and service. To meet myself, my friends, my family, and my work with love and to make the world just a little bit better before I die. To savor what I neglected in the busy time of building a family and career. To enjoy the gift of this life, the magic of

being alive, the wonders of creation, the beauty and tenderness of other human beings. To serve and contribute to healing and more love in the world. To dance under the stars, to ride my bike around the world, to hike remote mountains, to learn new languages, to laugh and play and cry with those I love. To learn and grow and evolve my soul. That is my *why*. What is yours?

The Japanese, who are the longest-lived people in the world, have a concept called *ikigai*, or “the reason for being.” In short, it’s the state of four elements: what you love, what you are good at, what you can be paid for, and what the world needs. The science is clear—those who have more meaning and purpose in their lives live longer, regardless of their lifestyle.

We live in a world that is full of expectations and demands and struggle, and for many of us, when we finally reach our “golden years” we are spent, tired, and often sick. One in six Americans has a chronic disease, and according to the National Council on Aging, about *80 percent* of older adults have at least one chronic disease and 68 percent have at least two.¹ No wonder so few want to live to be more than 100 years old. Aging seems to bring inevitable dysfunction, disease, and death. Aging is scary.

But what if instead you could live to be 120 years old, go for a hike with your beloved, swim in a mountain pond, cook and eat a delicious meal, make love, and then just drift blissfully out of this life? That’s how I would want to go. In fact, I am counting on it. But if that seems like a fantasy, it is only due to a failure of imagination. A failure to think about aging and disease in the light of the current science of human biology, a science that is disrupting all our concepts of health and disease.

Aging accelerates the risk of all chronic diseases—heart disease, cancer, diabetes, dementia, high blood pressure, autoimmune disease, and more. The truth is that what we see as “normal” aging is, in fact, *abnormal aging*. It is the result of myriad changes in our biology that are treatable. Aging is not considered a disease by most of medicine today. But what if we start approaching aging as a disease, and a treatable one at that? While American medicine has not embraced this idea, the World Health Organization (WHO) has officially recognized aging as a disease.²

But we are hampered by a medical paradigm that focuses downstream on symptoms and diagnoses, not upstream on causes and mechanisms. Remarkably the National Institute on Aging receives less than 10 percent of the National Institutes of Health budget—about \$2.6 billion. And of

that, only \$260 million goes directly to aging research; the rest is spent on the downstream diseases of aging, like dementia, not on the mechanisms or underlying causes of aging.³ Contrast that to the problems we are trying to solve. Our annual health care expenditures are about \$4 trillion, most of which are for aging-related diseases. Does it make sense that we spend only 0.0065 percent of the cost of the diseases driving those trillions in spending on research into the actual *causes* of those diseases, while we spend the vast majority of research dollars on how to treat those downstream diseases? It's like mopping up the floor while the sink continues to run rather than turning off the faucet. Rather than study the root causes and underlying mechanisms of aging, we look for drugs to block abnormal processes and suppress symptoms. But even if we found ways to completely cure heart disease and cancer, we would add only five to seven years to our life span. Nowhere near the doubling of life span that occurred last century with sanitation, antibiotics, and vaccines. The cost savings of extending healthy years of life even 2.2 years would be enormous—\$7 trillion over 50 years (or even more according to some researchers).⁴ Now imagine if we could extend it 20 or 40 or 60 years. Yes, a society of sick and frail old people is expensive, but what if they weren't sick? What if they were healthy and strong and contributing to their families, communities, and societies?

There is a scientific revolution happening today that is forcing us to change our entire view of health and disease. It is a paradigm shift as big as the discovery that the Earth is not flat or that the sun doesn't revolve around that Earth.

This revolution is called functional medicine (also known as systems medicine or network medicine)—which looks at the body as an ecosystem, a web of complex interconnected networks and systems that regulate our biological functioning; systems that, when out of balance, drive dysfunction and disease. It turns our approach to diagnosing and treating disease upside down.

The flaw in our approach to treating disease is that we think all diseases of aging—from heart disease to cancer, dementia, diabetes, and more—are *different* and that we need to find *different* cures for each one. However, the truth is that largely, they are just manifestations of the same underlying changes in biology that occur with aging and are highly influenced and *modifiable* by our lifestyle and environment washing over our genes.

Modern medicine treats each individual disease as if it were a distinct

entity separate from everything else that happens in the body. This is whack-a-mole medicine. We even have a word to describe how we think of these problems as separate. We call them *comorbidities*. A person can have high blood pressure, abnormal cholesterol, heart disease, diabetes, and cancer, and we treat all these as separate diseases, when in fact they are all just slightly different manifestations of the same underlying dysfunction in the body. Rather than asking why aging is the biggest risk factor for all these diseases, dwarfing smoking, obesity, and other “killers,” we treat them all individually. It’s upside down.

The exciting discoveries emerging from the field of aging research point to a radically new approach. Science is getting to the root cause of why we get sick and why aging is often accompanied by decline in function and decrepitude. If we understand the *why*—the root causes and the changes they trigger in our biology, in our interconnected web of molecules and cells and tissues—then we can transform our health and well-being and extend our lives, both our health span and our life span. By addressing what are often called the *hallmarks of aging*, we can prevent, treat, and even reverse most of those diseases without directly treating the disease. In *Young Forever* we will go even deeper and map out how to treat not only the hallmarks of aging but also the *underlying causes* of the hallmarks of aging.

This has been my life’s work: studying and applying this new paradigm of medicine, functional medicine, to tens of thousands of patients over 30 years. Diving into the networks, excavating their biology for clues to the root causes of disease, investigating the upstream drivers of disease. I have deeply explored their genetics, microbiomes, immune function, hormones, mitochondria, detoxification systems, and structural systems—the network of interconnected systems that explains nearly all disease. It has given me a deep understanding of the weblike ecosystem of our biology and has helped millions of people around the world.

The beauty of this approach is that it is never too late to start. Yes, starting at birth or even before is better, but the research is clear: Making changes at any age, even seventy, eighty, or ninety, can create profound changes in health and longevity.

Personally, I am training to be the healthiest 100-year-old I can be. What does that look like? It might be slightly different for each of us, but I define it as being able to get up in the morning and do what my heart and soul want to do: climb a mountain, read a book, go helicopter skiing, surf,

play tennis, make love, no matter what my age. I want to continue doing what brings me joy for the rest of my life. But I don't want preventable physical limitations to impede my ability to live life fully engaged, mentally sharp, and physically active. At sixty-three, I am in better shape than I was at forty. In fact, my biological age is forty-three years old. What I have learned over the last few decades is nothing short of revolutionary in helping me get biologically younger while I grow chronologically older. I want that for you too.

I have struggled with many health issues over the last 30 years, and through my own disease, pain, and suffering I have learned how to heal myself and so many of my patients. At thirty-two I had back surgery with complications that left me with a weak leg for the rest of my life. At thirty-six I developed chronic fatigue syndrome. For more than a decade I struggled with crippling fatigue, brain fog, digestive issues, muscle pain, and immune dysfunction—I had to find my way out by treating mercury toxicity, mold exposure, Lyme disease, autoimmune disease, and more. I learned how to heal my body using this new medical paradigm, addressing root causes and optimizing my biological networks.

Then in my midfifties I had a series of events—an infected root canal, a mold-infested house, and a broken arm—that threw my system into chaos. After taking the antibiotic for my root canal, I developed a nasty bacterial infection of my gut called *C. difficile* colitis as well as gastritis, where my stomach was raw and inflamed. And I was in a cytokine storm (flooded with inflammatory molecules), lost 30 pounds, and was in bed and in and out of the hospital for five months. I was near death, according to the doctors I saw. Again, it forced me to discover new ways to heal and to reimagine medicine, to learn how to renew, rebuild, and regenerate my body from the inside out. During the COVID-19 pandemic, I had another back surgery with more complications that left me with a permanent limp and chronic pain. I learned to rebuild my physical structure through the latest advances in regenerative medicine and now am stronger than ever and pain-free. While I wish I hadn't had to go through all that suffering and pain, it taught me so much about how the body works and how to renew my health, leaving me more energetic, stronger, and healthier than I had been since my twenties.

I have incorporated many of the practices and principles I learned into the *Young Forever Program* in this book. I know the science and practice of this new medicine both as a patient and as a doctor. I have seen what

may seem to be miracles: patients reversing type 2 diabetes, heart disease, high blood pressure, autoimmune diseases, depression, and even dementia, who become visibly younger using the science of functional medicine. The extraordinary ability we have to unlock the keys to disease reversal, rejuvenation, and aging backward is not a science fiction fantasy but science fact.

The principles and practices you will learn in this book will have remarkable benefits in your life. Not only will you live longer, reverse chronic disease, and shed pounds, but, more importantly, you will be filled with energy for life and work and love and play; you will be the full expression of who you came here to be. The point is not to live longer but to live better, not just to add more years to your life but to add more life to your years. While many my age are thinking about retirement and early bird specials, I am just beginning to dream about the second half of my life, the next 60 years and how I want to live. I have created a bucket list that includes wild adventures, learning new sports and languages, and living and traveling in remote and rugged places. It includes giving my knowledge, wisdom, and skills to those who need it, to contribute what I can to making this world just a little better than when I arrived, filled with a little more love and a lot more healing.

The Jewish faith has a guiding principle—*tikkun olam*, or the repair of the world, righting the wrongs, facing and addressing injustice and poverty. The gift of reaching sixty-three chronologically but being biologically decades younger gives me the energy and health to be in service of *tikkun olam*. I am on this journey as a scientist, doctor, and human who wants to explore the wonders of being alive with energy and vitality and joy. I invite you to join me on this journey, to step into a world of health and well-being beyond your wildest imagination.

So let's begin the journey, first to understand the science (I promise I will keep it simple and understandable) and then to describe the principles and practices and program that will keep you *young forever*.

Here's what you will learn:

In Part I, the *what*—the science of longevity:

- The revolution in longevity science

- How our current understanding of aging is based on abnormal aging, which is not inevitable
- How your biological age can be reversed even as you grow chronologically older
- The ten hallmarks of aging—the fundamental problems in our biology that occur with aging
- The root causes of the ten hallmarks from the perspective of functional medicine

In Part II, the *why* behind the Young Forever Program:

- How to stop and reverse biological aging: optimizing your seven core biological systems
- The science behind how to eat for longevity
- The science behind how to exercise for longevity
- The science of lifestyle practices for longevity
- How adversity and little stresses to your system (hormesis) activate longevity pathways
- The emerging advances in longevity treatments

In Part III, the *how*—the Young Forever Program:

- How to diagnose and test for the underlying causes of aging
- Using food as medicine to activate your longevity pathways
- Using nutritional supplements for enhancing health span and life span
- How to implement simple lifestyle practices and hormesis for longevity
- How to personalize your program to address your unique needs and imbalances
- My longevity routine: how I apply the longevity revolution to my own health and quest for a long and healthy life span

Let's get started!

PART I

HOW AND WHY WE AGE

Chapter 1

The Quest for the Fountain of Youth: Is Immortality Possible?

You are never too old to set another goal or to dream a new dream.

—LES BROWN

Are disease and death preprogrammed events that leave us powerless victims to their inexorable approach? Or is the secret of vitality and longevity buried in our DNA, our molecules, cells, tissues, and biological networks, the interconnected ecosystem that is our human form? Longevity was common in biblical times. Methuselah died at 969 years old; Noah was 950 years old; Adam was 930 years old. Today the longest-lived fully documented human in history was the smoking, port-drinking, chocaholic Madame Jeanne Calment, a Frenchwoman who died at 122 years old. Emma Morano, an Italian woman who ate three eggs and 150 grams of raw meat a day, died at 117 years old. Circulating the internet is a video of an Arab man who claims to be 110 years old and is father to a seven-year-old son. In India I have heard personal reports of sages and rishis (Hindu saints) who live well past 150 years old. It could be that they have no birth records, or couldn't count, but that raises the question: What is the limit of human life? Is there one? If we aren't meant to have a limit, would you want to live to 150? Or beyond?

THE BLUE ZONES—LONGEVITY IN PRACTICE

There are places in the world where people have already cracked the code, without knowing it, resulting in unusual longevity. Dan Buettner, a National Geographic explorer and author, researched the places on Earth with the longest-lived, healthiest communities, called Blue Zones (after the color of the marker an earlier researcher used to circle them on a world map). These communities have up to twenty times the number of people

reaching 100 years old or more than in the United States. What makes the communities unique is not their genetics—when Blue Zone inhabitants move to a more modern world, their disease and death rates parallel everyone else’s. It is something else, something I have been on a quest to discover, which led me to visit the Blue Zones. What I witnessed has shaped how I view aging, longevity, and, frankly, *living*.

JOURNEYING TO SARDINIA

In the summer of 2021, with Dan’s help and advice, I ventured deep into the Ogliastra region of Sardinia, the heart of Sardinia’s Blue Zone, which has the longest-lived men in the world. I was guided by two native Sardinians, Eleonora Catta and Paola Demurtas, and their travel company, There, to the homes and hearths of local Sardinians, into the world of centenarians, an ancient world that has remained much the same for the last 3,000 years. The mountainous region, home to the Sardinian shepherds, is remote and landlocked and has remained inaccessible to conquerors and outside influences until recently. I heard the Sardinians’ stories, witnessed their way of life, ate their ancient foods, drank their antioxidant-rich Cannonau wine.

The people of this region have preserved their ancient foodways. They still follow traditional methods of making cheese, wine, preserved meats, and olive oil and have a deep knowledge of the local plants. They understood that food was medicine even before Hippocrates! They are particular about what their goats, sheep, and pigs eat. They know that the flavors of the food come from the foods the animals eat, from the soil that feeds their plants, vegetables, and fruits. One farmer said to me, “We flavor the meat before we kill the animal.” The flavor comes from phytochemicals in the plants consumed by the animals. They don’t know these compounds are actually good for them. The food just tastes better. Sardinians eat some meat. They also drink goat milk, and their daily diet always includes sheep and goat cheeses.

On one side of a steep valley sat an old, abandoned, crumbling thirteenth-century village and just above it a newer one. In the 1950s the threat of a mudslide forced the villagers to evacuate and move a little farther up the mountain. At the edge of the old, abandoned village, an eighty-four-year-old shepherd, Carmine, sat on an old stone wall, his small rust-colored Panda parked next to him, driver’s door open. He had pulled over when he saw us behind him and wanted to talk. Imagine that in

America, someone just pulling over to the side of the road and flagging you down for a chat! He hasn't left this mountainside since 1989, when he went to visit one of his children on the Italian mainland. Carmine tends his six sheep and one goat, his chickens, and one pig amid his olive orchards, which comprise a 300-year-old olive tree among younger olive trees, growing together with pomegranates, almonds, persimmons, figs, chestnuts, and blackberries. And he grows a large garden of tomatoes, peppers, eggplant, chard, strawberries, and artichokes. He spoke of his simple life, his diet of minestrone soup, which is a staple here. Carmine's wife had died two years earlier, and he lives with his sister and her two daughters, like most Sardinians who stay in tightly knit family and friend units. His now smaller family can't eat all the food he grows, so he feeds what remains back to the animals or gives it away. His routine, the simplicity of his life, tending his animals and gardens, chatting with his friends, being useful and part of his community, and his curious mind keep him going. I asked how he spends his time when not tending his land and animals and he said he reads a lot. He opened the hatch of his Panda and pulled out a thick tome on world religions that led to a deep conversation about God, whom he is not so sure about, and climate change and the irreversible destruction of the planet. We spent three hours chatting about his life, touring his farm, and enjoying each other's company as he hiked effortlessly up and down the mountainside, calling to his sheep to come get a little ancient grain. I struggled to keep up with him as he bounded up the mountainside after his sheep.

The next day we went to visit Giulia Pisanau, who had turned 100 years old three months earlier. We talked for hours about her childhood. She was born in 1921. Her family had eleven children, and they were so poor during and after World War I they would each eat one potato a day and one egg split among all of them. She drank goat milk every day as well as minestrone soup, often with just a few zucchinis and a potato. She never married and worked for a family in Cagliari, the big city in Sardinia, for decades. Then she retired and built her own home. She spent her time doing embroidery, walking around her neighborhood, and hanging out with her friends. Still sharp, she does crossword puzzles every day. Her secrets to longevity: Do not be jealous or angry, take walks, do not stress about life, and live in gratitude. She is a wealthy woman, rich in love, meaning, and purpose. And she has no ailments except a slow thyroid and a little arthritis.