

DELAY AGEING

HEALTHY TO 100

INTRODUCTION



PRE-PUBLICATION EXTRACT WITH PRIVILEGED ACCESS

COLIN ROSE

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Healthy to 100

Colin Rose

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ABOUT THE AUTHOR

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He is a Fellow of The Royal Society of Arts and a Senior Associate of the Royal Society of Medicine. He has written on health, nutrition, science and learning for over 35 years and edited Dr Paul Clayton's best-selling book *Health Defence*.

Colin has also been an international educational advisor. Author of *Accelerated Learning* and *Accelerated Learning for the 21st Century*, which were translated into 12 languages, Colin was a main contributor to *EduScience* – a programme funded by the European Union which aimed to enhance the teaching and learning of science in schools in Europe.

He was a founder member of the UK's *Campaign for Learning* – a collaboration between government and industry.

Colin founded Accelerated Learning Systems in 1984 and Uni-Vite Healthcare in 1986. *Delay Ageing* is his tenth book.

He says:

"Although I am not a biologist, a geneticist, a physician or a gerontologist, I believe I do know how to interpret scientific research and make it accessible for a general audience.

"That's what I did many years ago, when I took the then latest research on the brain, learning and memory to develop and write *Accelerated Learning*.

"So, this book combines both my interests – education and health. Its purpose is to make some very important research, which not many people would read in its original form, both understandable and actionable.

"I leave you to judge if I have succeeded."

A handwritten signature in black ink, appearing to read 'Colin Rose', with a horizontal line underneath.

PRE-PUBLICATION EXTRACT

EDITOR'S NOTE

The book uses British spelling in the main text. However, direct quotes, titles of books and papers, and names of institutions and organisations are generally reproduced in their original published spelling. Hence, the spellings “ageing” and “aging” both appear.

DELAY AGEING

by Colin Rose

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INTRODUCTION

WHY WE NEED TO DELAY AGEING

What if getting older didn't mean getting ill?

Most people accept that growing older means suffering illness – less energy, a risk of cardiovascular disease, brain disorders, cancer, aching joints and increasing frailty. Most people shrug and say: “It’s just the way life is”.

You’ll be pleased to know that most people are wrong.

Researchers at universities like Harvard Medical School, Cambridge, Oxford, University College London, UC Berkeley have all – over the last decade – come to another conclusion.

It’s best summed up by Professor Linda Partridge, Director of the Institute of Healthy Ageing at University College London:

“Ageing is a malleable process.”

You can directly influence how fast, or slow, you age.

David Gems is Professor of the Biology of Ageing at University College London and Deputy Director of the Institute of Healthy Ageing. He agrees:

“If ageing is delayed in humans you would have a reduction in most or all ageing related illnesses – cancer, dementia such as Alzheimer’s, cardiovascular disease, type 2 diabetes, blindness, osteoporosis.”

Join me in a biological detective journey into the new science of healthy ageing. You need no prior knowledge but be prepared for

surprises – because it's not just a simple matter of eat your greens and move more.

What you'll learn can transform your health – or your parents' health – as it has mine. You'll discover exactly what Silicon Valley billionaires are investing fortunes to learn.

Of course, they are planning to develop patentable drugs, wearable health monitors or high-tech procedures like gene editing or stem cell transplants. Because they know that if we can delay ageing, we can delay the onset of 'age related' diseases and the market for their products will be enormous.

In contrast, every single age-delaying strategy we will explore will involve natural solutions that you can start tomorrow – whatever your age. Because you will discover changes you can make in your 50s, 60s 70s, even 80s that will result in a healthier, longer life.

It's never too late.

Health extension rather than life extension

The potential impact on your personal quality of life in your later years is transformative, but extending your healthy lifespan also has a significant economic benefit.

Richard Faragher is a Professor of Biological Gerontology at the University of Brighton, England and Chair of the British Society for Research on Ageing. In a recent video he points out that over half of people over the age of 65 will ultimately spend over £20,000 of their own money on social care, with 10% of them spending over £100,000. Money they had hoped to leave to their children.

The economic savings of delaying ageing for society would be in the trillions – since an estimated 40% of the National Health budgets in the UK and USA are spent on the years when age-related diseases have surfaced.

The aim is NOT to pursue a delusional 'fountain of youth fantasy' of living to 150. That would be planet destructive. The aim IS to

extend the years when you live fit, happy and well with your family – though some life extension is likely.

There's no point in living longer unless it's fun to be alive.

The other aim is to be able to continue to contribute productively to society. Indeed, a large cohort of fit and well older people working, for example, with charities, contributing economically and on projects to improve local environments, could greatly benefit society.

Indeed, we **MUST** engage with healthy ageing. Because if we don't improve people's health in later years, the cost to society in medical bills will be an unsustainable burden for the decreasing numbers of younger full time employed.

That's because our current model of healthcare is flawed. The principal focus is on cure, not prevention. Wait until a disease has surfaced and zap it with a 'magic bullet' drug. In fact, it's worse than that. Most of the time patients are not cured, but merely enabled to live with the disease rather than die of it.

Fortunately, we now know how to restore tissue and organ function to a younger state. How to separate biological from chronological ageing. How to increase 'health span' rather than just life span.

The scientists measure it as Quality Adjusted Life Years (QALYs). I prefer more life in your years, rather than more years in your life.

Cutting edge science

There are well over 100 university and national centres of ageing research around the world – many individual scientists are listed in Appendix 1.

These researchers are generally agreed that there are nine, universal '**Hallmarks of Aging**' – originally identified in a much-cited paper in *Cell Journal* 2013 authored by Carlos López-Otín, Linda Partridge and others¹.

These hallmarks are biological processes, common to all of us, that underly ageing and which – if they are not counteracted – will inevitably lead to ‘age related diseases’.

I have reviewed hundreds of studies and spoken to health researchers and the science is clear: each one of these markers, or ‘hallmarks’, of ageing can be slowed, delayed, or in some cases stopped or even reversed. You’ll even meet a researcher whose test subjects actually aged backwards!

The result is to increase the years you stay healthy.

The nine **Hallmarks of Ageing** are as follows.

1 Damage to DNA accumulates

This leads to ‘gene instability’, to mutations and loss of cell function. DNA damage is central to ageing, cancer and deeply implicated in both Alzheimer’s and heart disease. But it is possible to boost your level of cell repair.

2 Cells become ‘senescent’

When a cell ages and can no longer function properly, it is normally replaced with new healthy cells. As they age, however, some cells deteriorate but do not completely die.

These senescent cells hang around like ‘zombies’ and pour out toxins that cause inflammation. Inflammation promotes ageing, and is a key driver of atherosclerosis, heart disease, diabetes, dementia and arthritis, creating a condition where cancer cells can spread. The good news: researchers have discovered how to help clear away these ‘zombie cells’.

3 Mitochondria become dysfunctional

Mitochondria are the tiny power plants in almost every cell. Dysfunctional mitochondria lead to loss of energy, muscle weakness, fatigue and cognitive problems. However, there are specific foods and nutrients that can boost your mitochondrial repair.

4 Beneficial genes are switched off, harmful genes are on

Your genes are fixed, but the way they are ‘expressed’ – turned on or off – is something you have some significant control over. Scientists call this ‘epigenetic change’. We will see how certain foods and lifestyles can turn on genes that contribute to health and turn genes off that lead to disease.

5 Stem cells become exhausted

Stem cells can develop into different cell types, from brain cells to muscle cells as needed. But the body has a limited number of adult stem cells and the number declines with age. It is possible, however, to slow down the rate of stem cell decline.

6 Cells fail to communicate properly

Cells need to ‘talk’ to each other and to sense each other’s boundaries otherwise disease and especially cancer can develop. Fortunately, there are specific nutrients that improve cell communication.

7 Telomeres become shorter

At the end of your chromosomes are tiny ‘caps’ of DNA that have been likened to the caps at the end of shoelaces. Every time a cell divides these caps – or telomeres – become shorter. If these telomeres shorten too much or become damaged, the cell dies or becomes senescent.

You will learn how particular foods and nutrients can help maintain the length and health of your telomeres.

8 The body fails to sense nutritional intake properly

This not only leads to people becoming overweight, but to a blunted reaction to key hormones like insulin – leading to diabetes and many other diseases. And the body ratio of fat to muscle increases. However, it is possible to significantly improve your cells’ ability to sense when nutrient levels are

inadequate or excessive. That's key, not just to ageing, but to maintaining a healthy weight.

9 Proteins accumulate errors

We think of proteins as part of what we eat. In fact, you *make* thousands of different types of proteins and these proteins do most of the work in your cells. They transmit signals, move oxygen around the body, create structures like collagen, create immune antibodies, and read the genetic code stored in DNA.

But if proteins become misshapen, they cannot function properly. Organs malfunction, bones weaken, immune function declines. We will find out how to reduce the level of protein error, which otherwise will increase over time.

To the original nine *Hallmarks of Aging*, I have added a tenth. One that many researchers are working on:

10 The microbiome becomes unbalanced

Your microbiome is the collection of microbes living in your gut. When the ratio of good to bad bacteria goes out of balance, the results are a poorer metabolism of food, a weakening of the immune system, and the surfacing of many common health problems.

Because the gut and brain are directly linked, the latest research also shows that, if your microbiome becomes unbalanced, mood and brain function can be directly and adversely affected.

However, you can improve your gut health by including more fermented foods and fibre in your diet, with a Mediterranean style diet and sometimes with a course of probiotics.

There are universities and pharmaceutical companies working hard to develop drugs to stop, prevent or slow each one of these ten reasons why we age. The attraction of drugs to researchers is that they are 'silver bullets' – studies identify a problem, and the drugs

hit that specific target. They are usually very profitable, which helps pay for the research.

But drugs quite often come with side effects – so we will try to answer a more exciting question:

What if we tackled all the hallmarks of ageing simultaneously?

Not with drugs, but with food and nutrition and some simple-to-add lifestyle changes?

I have included a guide on how you can stay fit with just 30 minutes of activity a day, and one on de-stressing techniques, because mental wellbeing is every bit as important as physical health to ageing well.

Delay Ageing also includes a chapter on how to protect yourself against Alzheimer's, because there is a lot you can do to decrease the risk of this most feared disease.

Everything is connected

You will see, as we unravel the latest science – much only published in 2020 – that all these markers of ageing are interlinked, as are the solutions. Because the causes of ageing are so varied, ways to counteract them must be equally comprehensive.

Is it true that, as one prominent researcher has claimed, there is a single master group of genes that control all the process behind ageing? A group of genes called SIRT genes?

Although we will be looking at SIRT genes, the great majority of researchers believe that ageing is far more complicated than a single set of genes which can, possibly, be manipulated. That was the conclusion of a major 2019 paper in the leading scientific journal *Nature*².

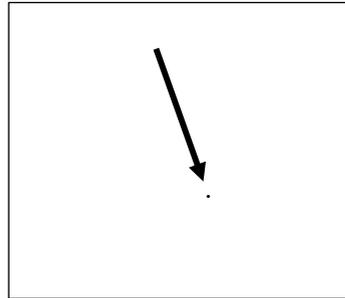
But hold fire!

As you read all the ways to delay ageing, you will see many of the same foods and nutrients and solutions mentioned again and again. By all means, make a tentative list but hold back until you get to Chapter 17, where we will summarise an easy-to-follow plan to delay ageing.

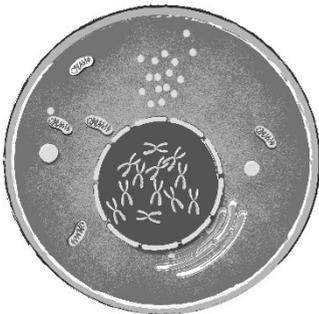
You are, literally, amazing

Before we start, pause a moment to reflect on how incredible your body is.

Look at that dot in the middle of the box on the right. You can hardly see it, which is why I added the arrow. Yet it's a little bigger than the very largest cell in a human body. The egg. All other cells are so small that they are invisible to the human eye.



Now look at this illustration of a human cell enlarged hundreds of times.



Into that tiny, tiny dot in the square above are packed the cell's membrane, which includes sensors that communicate with other cells, its mitochondria, which produce energy, and its ribosomes, that produce the thousands of proteins every day that make your body work.

But even that is not what is so incredible. Almost in the middle of the cell, you will see the round nucleus. In that nucleus are packed your chromosomes (the little ‘X’ shapes), and on those chromosomes are your DNA.

If you stretched out the DNA in a single cell, it would be 2 metres long on average!

Around the outside of that microscopic cell – and inside too – are receptors. These continuously sense and interpret the chemicals in your blood stream like hormones, vitamins, minerals, toxins, pharmaceutical drugs, and trigger an appropriate response. Each sensor does that millions of times a day.

The scale is almost unimaginably small and yet the daily activity level within every one of your cells is almost inconceivably huge.

The average body has an estimated 37 trillion cells – 37 million million. Those cells make tissues and tissues make organs. So, your health and ageing are ultimately controlled at the level of the cell.

About 50 billion cells die and are replaced each day. All those new cells need the best possible nutrition if they are to function well and not to build tissues that age prematurely. That’s our focus.

Our objective for healthy delayed ageing

Three quotes help sum up our objective.

The first is from Dr Nir Barzilai, Director of the Institute for Aging Research at the Albert Einstein College of Medicine who says:

“Death is inevitable, but aging is not”.

Well, chronological ageing *is* inevitable, but we don’t have to suffer the generally accepted biological consequences.

The second is from age researcher Dr Corinna Ross, a biologist at Texas A&M University in San Antonio:

“I’m not interested in creating a population that lives to be 150, because that would be a problem for the world we live in.

“But if we can keep people out of nursing home care and reduce the number of Alzheimer’s and Parkinson’s patients, that would be ideal.”

The third is from Dr Brian Kennedy, former president of the Buck Institute for Research on Aging in Novato, California.

“We’re better at keeping people alive with the various diseases of ageing, but we rarely bring them back to full health ...

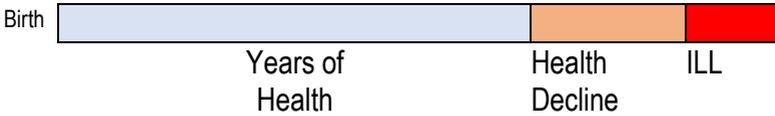
“I think it’s going to be much better for the quality of life of the individual, and much better economically, if we can just keep them from getting sick in the first place.”

Prevention is far better than cure.

Unfortunately, that’s not the current model of our healthcare systems. Although, of course, doctors, hospitals and pharmaceutical companies want you to get well, the current model is that they mostly only get paid when you are sick.

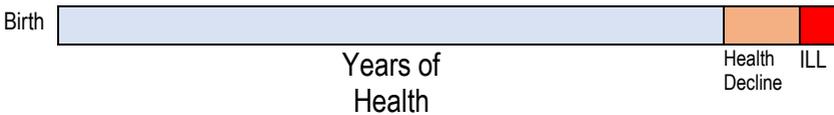
It's time we changed

We can visualise our objective in two timelines. Without intervention, this is the life pattern the average person can expect:



LIFE PATTERN WITHOUT INTERVENTION

This, realistically, is what our life pattern could be, based on the evidence of the hundreds of studies behind this book.



WHAT OUR LIFE PATTERN COULD BE

The Big Picture

