
# :Longevity:

## Evidence-Based Lifestyle Strategies for Living Healthy, Happy and Long Lives.

**BY**

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# THE FACT 1

**A HAUSA QUOTE:**

**“Idan Kura Nada Maganin Zawo  Tama Kanta”**

**English Meaning:**
**“If a Hyena has cure for Diarrhoea Let it treat itself”**

# Health span or Lifespan

# 85 HEALTHY & HAPPY

- **AGENDA**
- **PART 1**
- Some **FACTS**
- Mankind is living long with a big disparity between developed and developing countries
- Some **Myths** based on cultural or religious backgrounds negatively impact longevity
- Big Pharmaceuticals do contribute both negatively and positively to Longevity
- Steps to take for a Healthier Happier & Long life
- Lessons from the Blue Zones
- **A Longevity Action Plan**
- What You Can Do TODAY
- What you can do NEXT Week & Onwards to Live a Healthy Happy and Long Life.
- Aim NOT just to Live Long, But Live Healthy Happy & live long dying young
- Aim: Move beyond Life Span to health Span
- **PART 2:**
- **EVOLUTION AND ADVANCES IN THE SCIENCE OF AGING AND LONGEVITY. A RACE TOWARDS THAT MAGIC PILL?**

# FACTS:
# People are living to 100 and More in Developed Economies

OPINION
GUEST ESSAY

## How would you feel about a100 year- old doctor?

Nov 28,2022
New York Times

OPINION
LETTERS

# I'm a 100-Year-Old Doctor. I'm Not Too Old to Work.

The doctor mentioned in a guest essay about older physicians gives his perspective.

Jan. 17, 2023

Dr. Howard J. Tucker via What's Next Film

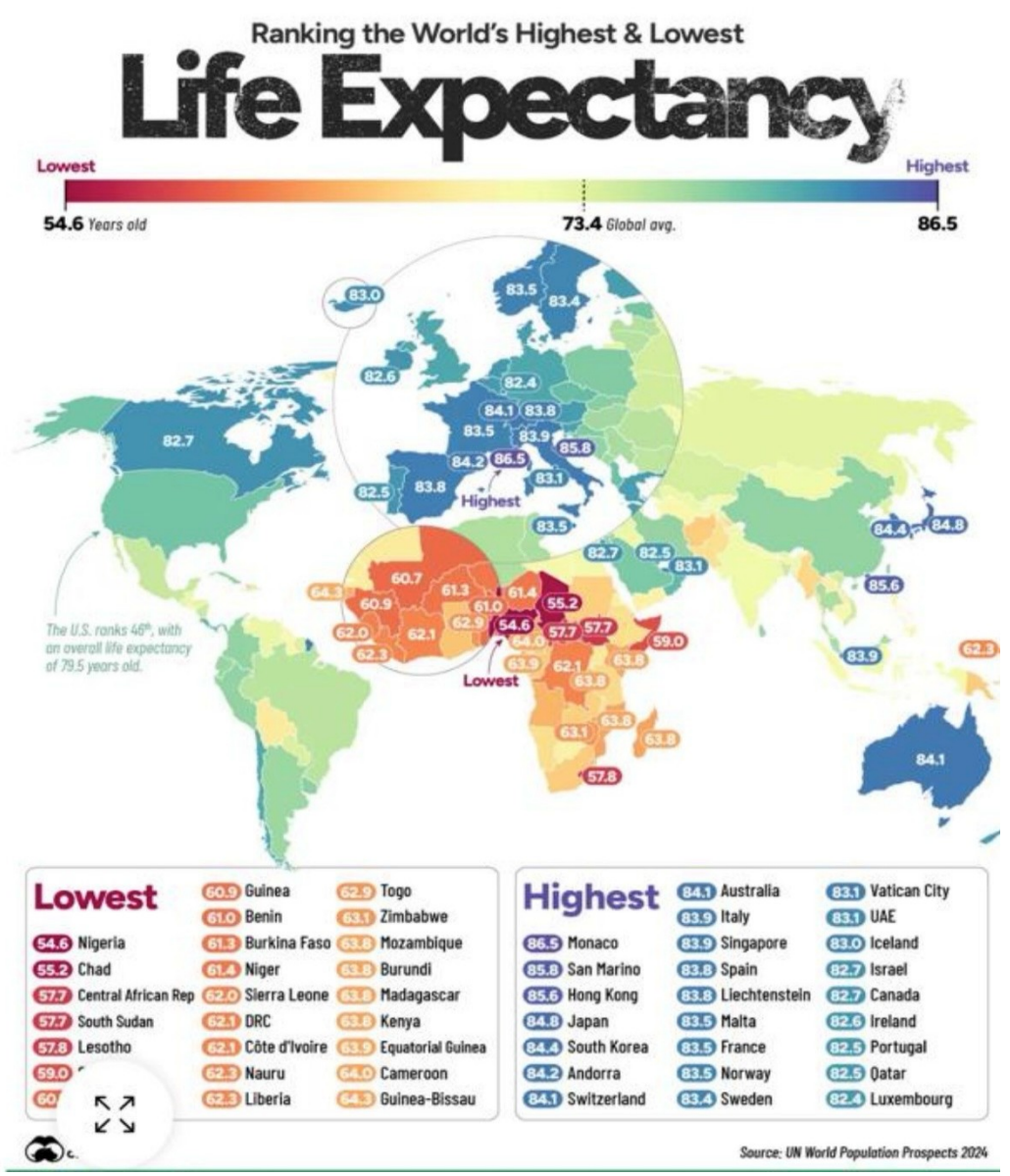
**A CANADIAN NEUROGIST STILL WORKING AT AN AGE OF 108 YEARS**

- At 107 Dr Brenda Milner British Canadian Neuroscientist is still active in teaching and supervising Postgraduates at McGill University Canada.

- She  remains an active Professor in the Department of Neurology and Neurosurgery.
- Described as a productive researcher at 107 in March 2026.
- 25 Honorary degrees from various universities

# HIGHEST AND LOWEST LIFE EXPECTANCY AROUND THE WORLD

**This map ranks the countries with the world's highest and lowest life expectancy based on UN World Population Prospects data (2025)**



## WHERE DO PEOPLE LIVE LONGEST?

**At the top of the list are small, wealthy nations and developed economies in Europe and East Asia**

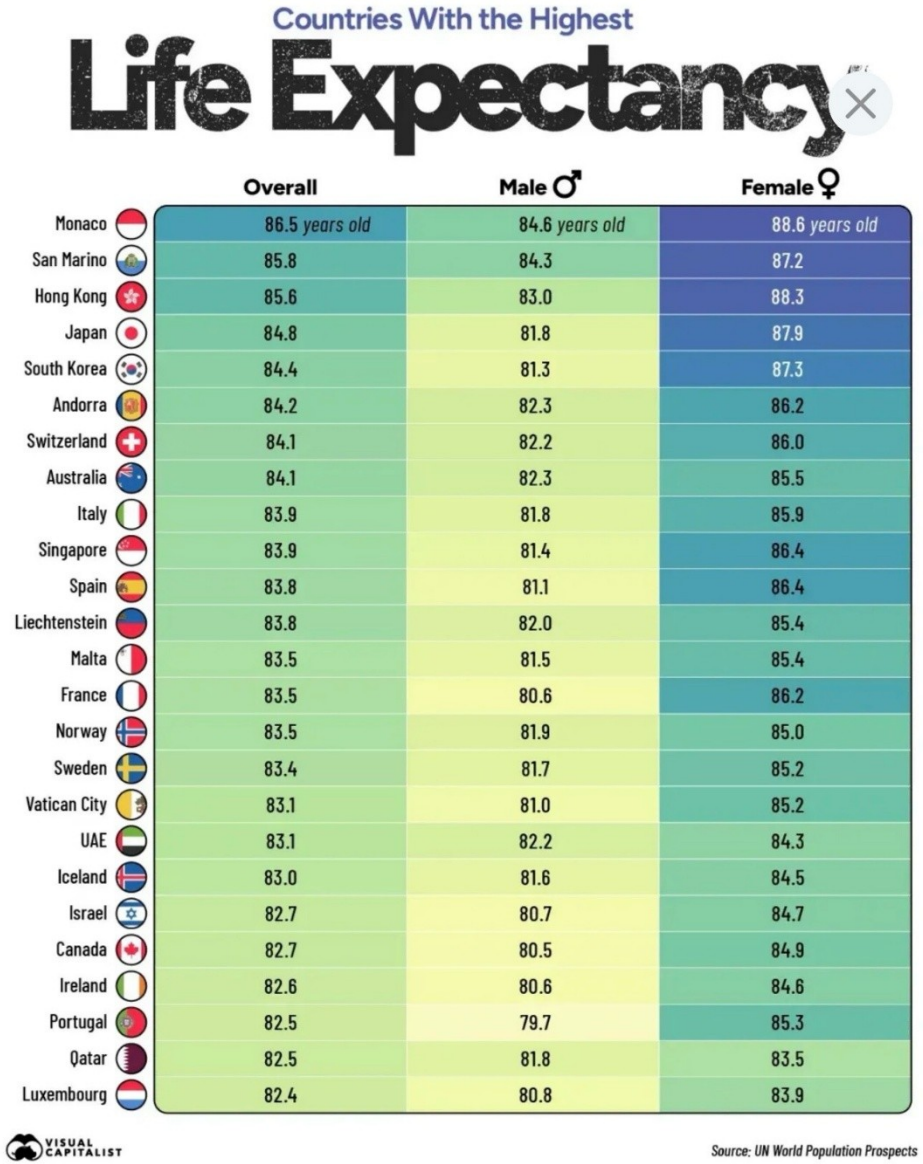
**Monaco  86.5 years**

**San Marino 85.8 years**

**Hong Kong 85.6 years**

**REASON: High standards of living and health care systems.**

**Additionally small European countries such as Andora, Switzerland, Malta Liechtenstein are not only high-income nations, the are renowned for their low crime rates and high quality of life.**



# HEALTH CARE SPENDING

## Many Countries where people live the longest have a high per capita health care spending.

**Health Care Spending Per Capita (≈2022)**

**Monaco: ~$7,650** per person
macrotrends

**Hong Kong: ~$3,330** per person
(CHE per capita reported by Hong Kong Health Bureau / WHO)
info

**Japan: ~$3,890** per person
healthsystemsfacts

**San Marino: ~$3,875** per person
macrotrends

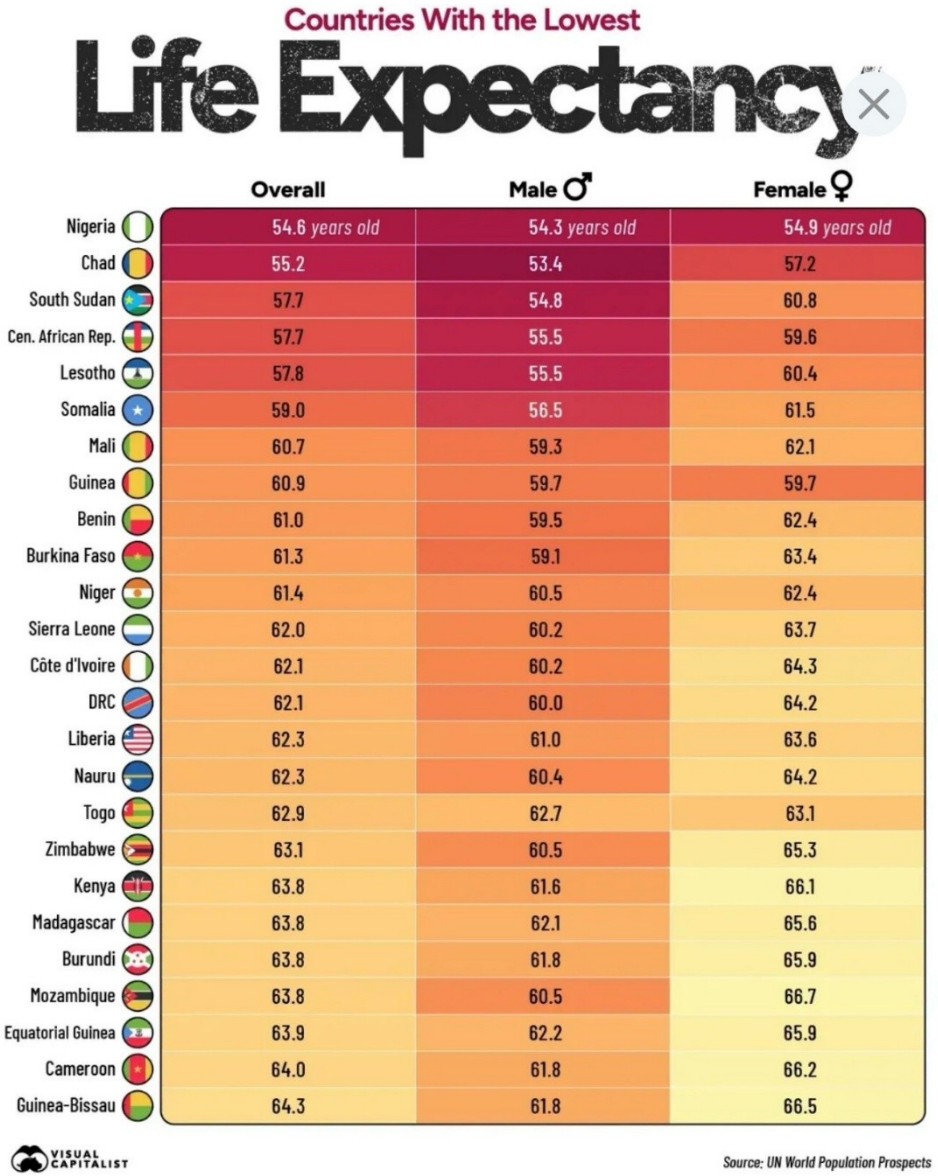
## REGIONS WITH THE LOWEST LIFE EXPECTANCY:

### Summary of Key Insights

**1. Overall , 24 of the 25 countries on the list are located on the African continent, divided between East and West Africa.**

**2. Nigeria, fourth largest economy in Africa, has the lowest average life expectancy in the world at 54.6 years**

**3. Nauru, an island country in Oceania, is the only is the only non- African nation on this list.**



**Additional Important Insights**

**1. In almost every country listed, women have a longer life expectancy than men:**

**South Sudan (6-year gap)**

**Mozambique (6.2 -year gap).**

- **A GLOBAL LONGEVITY DIVIDE!**

- Although Globally Life expectancy continues to climb, but the gap between the longest and shortest-living nations remains wide, with over 30 years between Monaco and Nigeria.

# Do Women Live Longer than Men?

- Womenn outlive men in every country on the top 25 list.
- Across all 25 countries, women live an average of 4 years longer than men.
- The gender life expectancy is especially large in places like France (5.6 years), South Korea (6 years), & Japan (6.1 years)

## THE MYTHS:

# 1. Genetics is the Only Factor

## wrong!

**There is a myth that genetics alone dictates how long a person lives.**

**But studies have shown that environmental influences and personal choices, such as diet and exercise, are equally significant in determining lifespan.**

# Myth 2:
# You can’t change your lifespan

- **Wrong**
- **Many people because of religious or cultural backgrounds or a combination of both believe that their lifespan is predetermined and unchangeable.**
- **Research shows that lifestyle changes, such as diet, exercise and stress management, can significantly positively influence life expectancy**

## Myth 3: Supplements Ensure a Longer Life

## Not True!

**A Multi-billions Industry**
**Leading many to believe dietary supplements can provide a shortcut to longevity.**

**FACT: True longevity is only achieved through a balanced lifestyle that includes proper nutrition, physical activity and mental well-being, rather than relying solely on supplements.**

# Disease Conditions Leading to Vitamin Deficiencies

| | |
|---|---|
| **Malabsorption Syndromes** | Conditions that impair the intestine's ability to absorb nutrients, leading to deficiencies in vitamins like B12, A, D, E, and K. |
| **Celiac Disease** | An autoimmune disorder where ingestion of gluten damages the small intestine, affecting nutrient absorption and causing vitamin deficiencies. |
| **Crohn's Disease** | A type of inflammatory bowel disease that can damage parts of the gastrointestinal tract, leading to malabsorption of vitamins. |
| **Pernicious Anemia** | An autoimmune condition that affects vitamin B12 absorption due to lack of intrinsic factor in the stomach. |
| **Alcoholism** | Excessive alcohol intake can impair the absorption and storage of several vitamins, including B vitamins. |

# Timeline on Deficiency

## Early Recognition of Deficiency

Understanding the initial signs and importance of addressing deficiencies in various contexts.

## Advancements in Detection Techniques

Development of methods and tools for early and accurate identification of deficiencies.

## Impact on Health and Development

Research highlighting how deficiencies can affect overall health and development.

## Nutritional Interventions and Prevention

Strategies and programs aimed at preventing and correcting deficiencies, especially in vulnerable populations.

## Current Challenges and Future Directions

Ongoing issues and emerging solutions in managing deficiencies effectively.

1. **Life -Style Choices Matter Significantly**
2. **Nutrition Plays a Vital Role**
3. **Physical Activity is Essential**
4. **Social connections: Strong relationships enhance longevity & healthier lives**
5. **Genetics explain only about 20-30% of Lifespan**
6. **Lifestyle and Environment matter more**
7. **Chronic diseases shorten life: Heart disease, diabetes, cancer and Stroke remain the main threats to longevity**
8. **Prevention Works e.g. Early detection of disease conditions and good surveillance**
9. **Good and Effective Medical Care: Vaccinations and effective health systems extend life**

# Lifespan v Healthspa

- **It’s not Just  about Living Longer**
- **Key definitions:**
- **LIFESPAN: Total years lived**
- **HEALTHSPAN: Years lived in good health,**

**Free from chronic disease and disability**

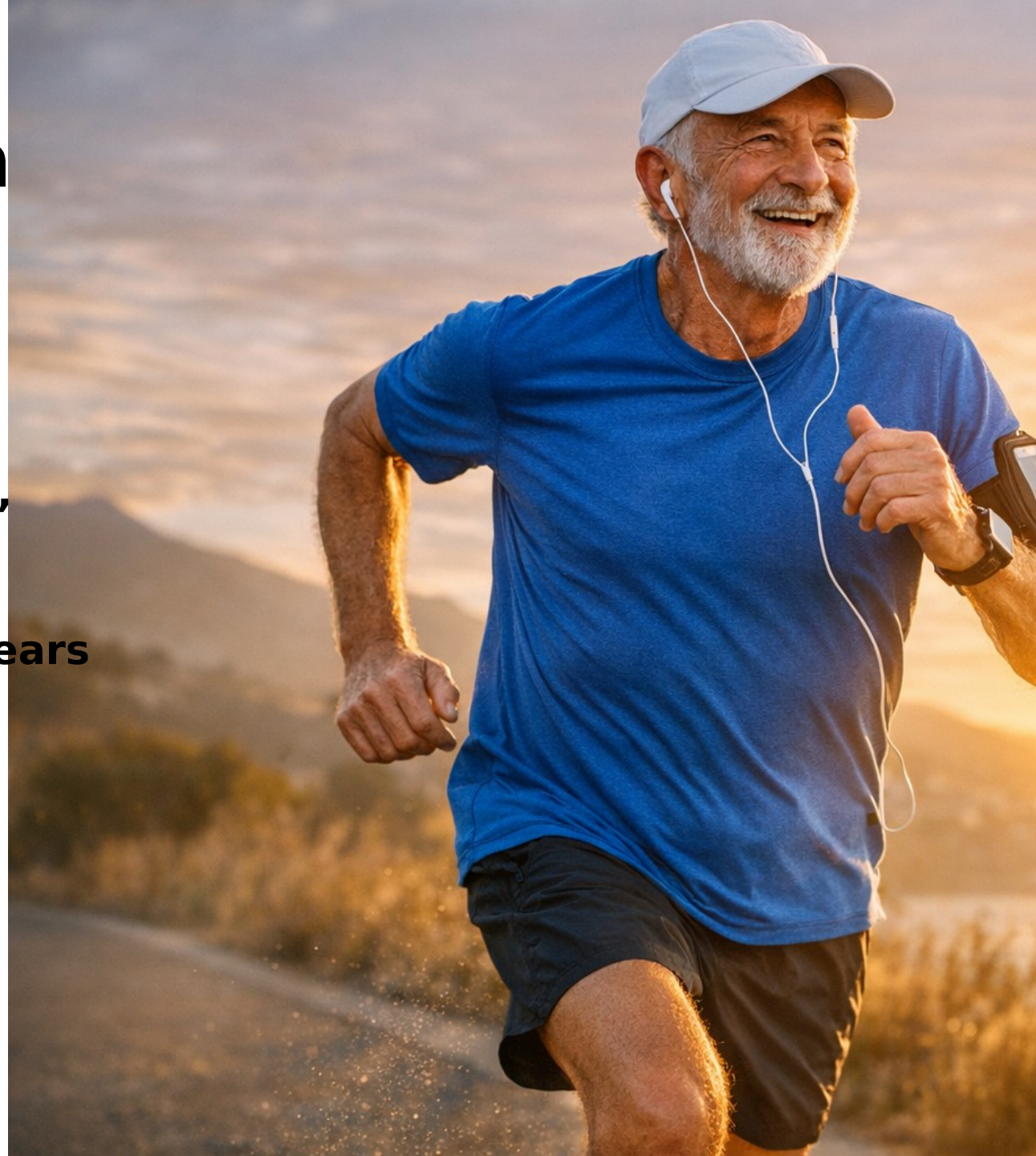
**THE GAP: Statistics show the last 10-15 years**

**Of life are often plagued by illness.**

**GOAL: To compress morbidity**

**(delay  the onset of disease) :**

**Ref. 1 Cumminse.m.(2015): Lifespan and Hwalth span:: Past, Present and Promise The Gerontologist**



# WHY DO WE AGE?

- Aging is driven by specific cellular damage over time- period.

**The Key Hallmarks simplified:**

1. **Genomic Instability: DNA damage**
2. **Telomere Attrition: Shortening of protective Caps on chromosomes**
3. **Mitochondrial Dysfunction: Decline in cellular Energy production**
4. **Cellular Senescence: “Zombie cells” that Accumulate and inflame surrounding tissue**

**See Ref. 2 Lopez Otin Cet al (2015) The Hallmarka Of Aging Cell**

# GOOD NUTRITION

- **CALORIC RESTRICTION AND FASTING**
- **Key Concepts:**
- **Caloric Restriction: Reducing calorie intake while maintaining nutrition has been shown to extend lifespan in animals**
- **Intermittent Fasting: Triggers autophagy (cellular clean up)**
- **Blue zones: Diets rich in plants and legumes and low in processed foods (e.g. Ikaria, Sardinia)**
- **Recommendation: Plant-slant diet, limit protein from red meat**
- **Ref: “Longo V.D. & Panda, S (2026) Fasting, Circadian Rhythms and Time-Restricted Feeding. Cell Metabolism”**

# PHYSICAL ACTIVITY

- Regarded as “**The Most Powerful Drug**”
- **Key Mechanisms**:
- Improves cardiovascular health
- Promotes Mitochondrial biogenesis (creating new energy centres in cells)

**Aerobic:** 150 mins/week is moderate activity

Strength Training: 2x/week to prevent sarcopenia ( muscle loss)

Ref: “Ekelund U et al (2019) Dose Response Association between accelerometry measured physical activity and sedentary time with mortality. BMJ”

# Sleep & Circadian Rhythms

- **The Science:**
- **During deep sleep, the brain clears out beta-amyloid**

**(waste products) via the  lymphatic system**

**.Circadian rhythm regulates hormone function (Melatonin, Cortisol)**

**Consequences of poor sleep:**

**a) Increased risk of Alzheimer’s**

**b) Cardiovascular disease**

**d) Insulin resistance**

**GOAL: 7-9 hours of quality sleep; consistency in wake/sleep times**

**Ref: Walker, M (2017): Why We Sleep: Unlocking the power of Sleep and Dreams**

# Stress Management & Mindset

- **Mind-Body Connection**
- **The Problem: Chronic stress elevates**

**Cortisol, which accelerates telomere**

**Shortening.**

- **The Solution:**
- **A) Purpose:  Having a reason to get up in the mo**
  **linked to longevity.**
- **B) Social Connection: Loneliness is as**

**Harmful as smoking 15 cigarettes a day**

**Ref: 1. Buettner, D (2017): The Blue Zones of**

**Happiness.**

**2. Holt-Lunstad, J et al (2010) Social relationships**

**And Mortality risks. PLoS Medicine**

# Case Study: The Blue Zones

1. Move  naturally (not necessarily workout)
2. Purpose
3. Downshift (stress reduction)
4. 80% Rule
5. Plant slant
6. Wine  x5 (moderate alcohol in community)
7. Belong (faith- based community)
8. Loved ones first
9. Right tribe (social circles reinforce healthy behaviors)

- Ref: Buettner, D & Skemp S(2016) Blue Zones: Lessons From The World’s Longest Lived American Journal of Life - Style Medicine

# MAIN TAKEAWAYS
# LONGEVITY ACTION PLAN:

- **TODAY**
- 1. Move for 20 minutes (NEAT-None Exercise Activity Thermogenesis)
- Add a serving of greens to your meal
- Call a friend or family member

- **THIS WEEK**
- Try a 14 hour fast (e.g. 7PM-9AM)
- Schedule Your Strength Training
- Identify your purpose (“Ikiga”)

# CONCLUSION TO PART 1

- THE FUTURE IS HEALTHY AGING
- Longevity isn’t about a magic pill, it’s about consistent lifestyle choices that optimise cellular health

As Ashley Montagu said:

**“The goal is to die young…..as late as possible”**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- ADVANCES IN MEDICAL SCIENCE

# PART 2: ADVANCES IN THE SCIENCE OF AGING AND LONGEVITY

# Evolution of the Science of Aging (1950s - 2050s)

1950s

1990s

2000s

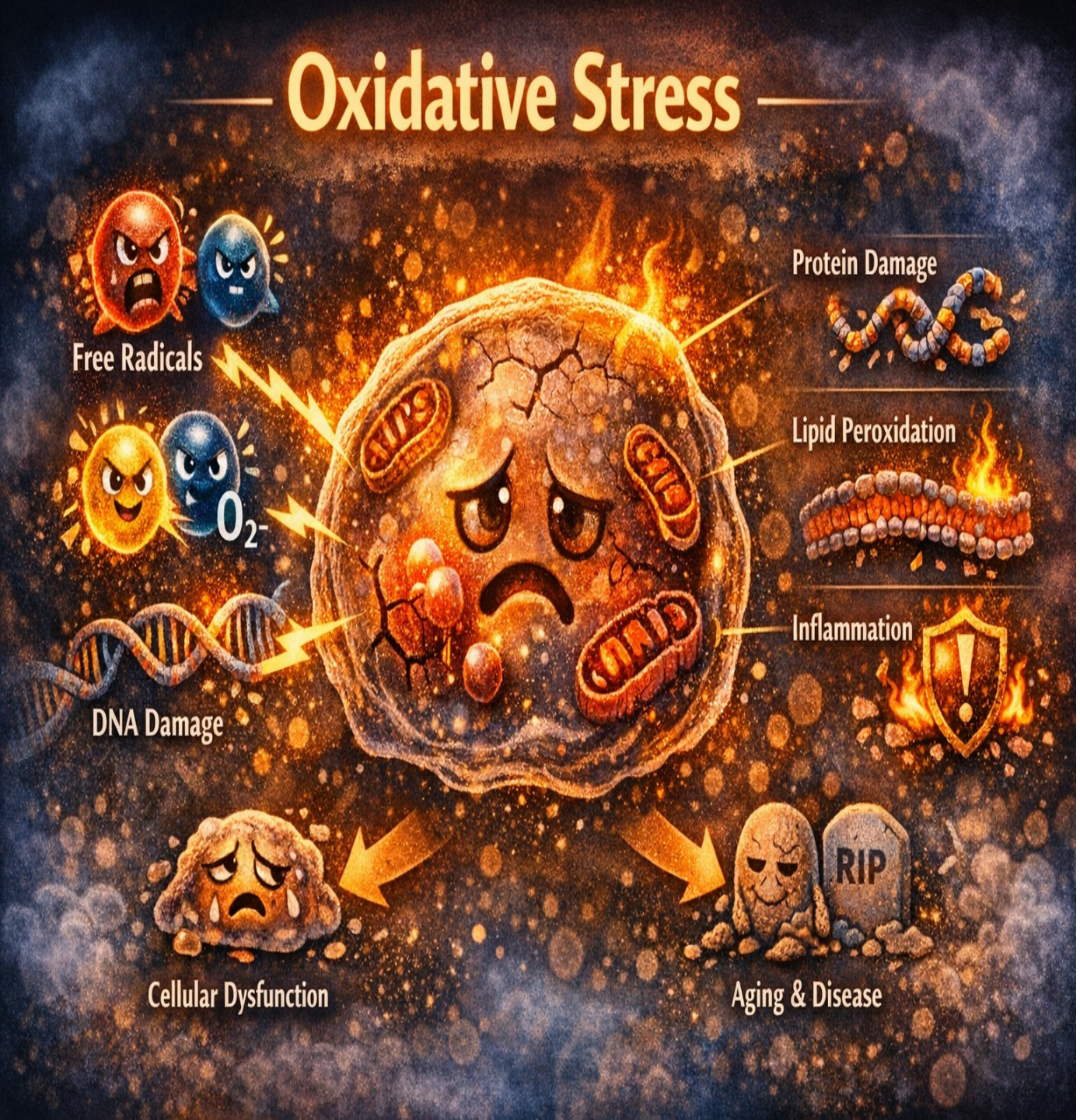
2020s

# EARLY 20th CENTURY

**Initial theories of aging on genetics and environmental factors laying the groundwork for future research**

# 1950s

Discovery of cellular aging processes, high lightening telomere shortening as a key factor in human lifespan




# 1990s

Introduction of the free radical theory of aging which links  oxidative stress to aging and longevity


# 2020

- Emerging research on epigenetics and lifestyle interventions demonstrate their significant role in healthy aging
- Advancement in AI and machine learning led to new insights in aging research, optimising research processes and data analysis

# Advances in Science of Longevity

## Recent Breakthroughs

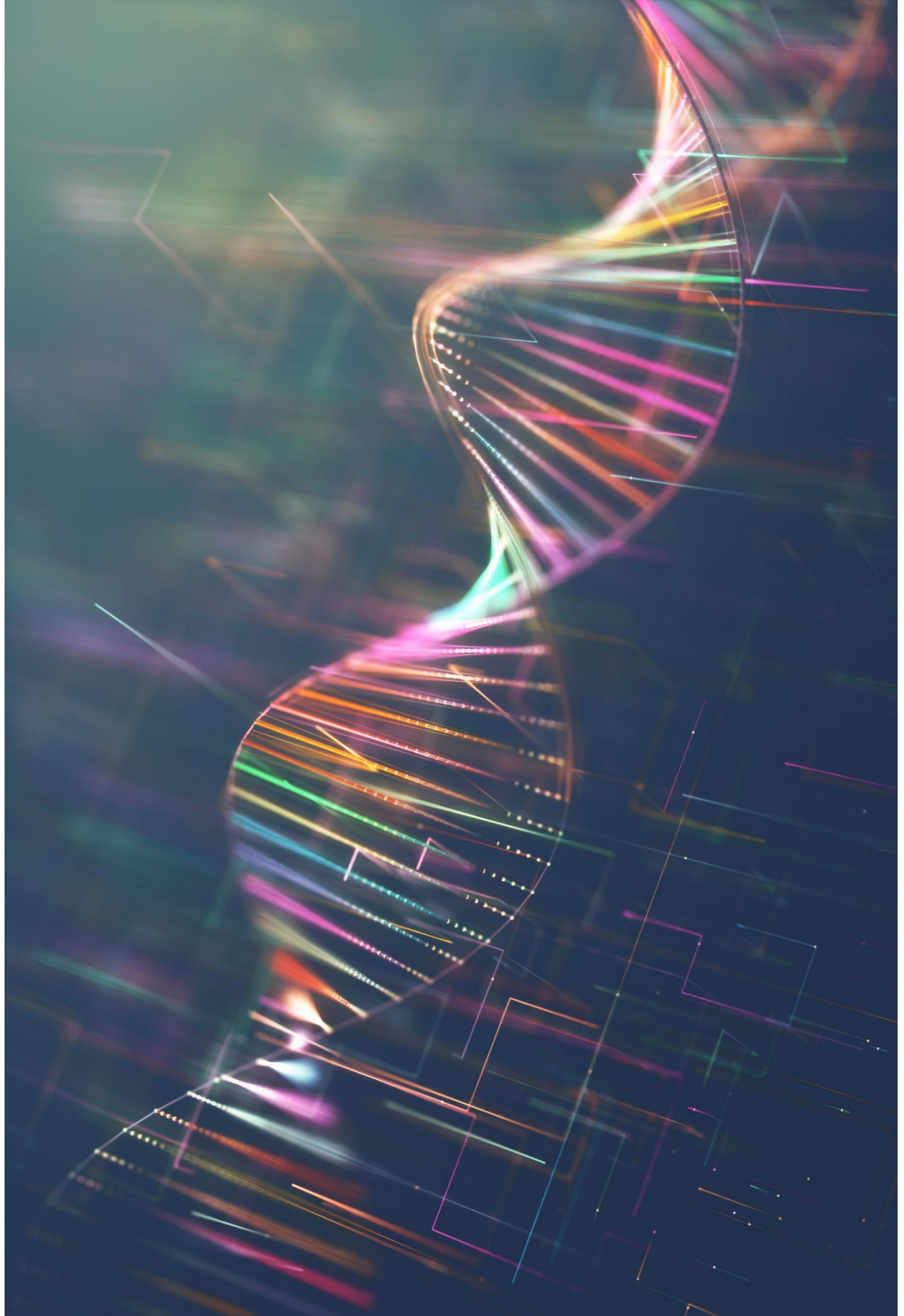
Innovations in genetics, biotechnology, and personalized medicine are extending lifespan and healthspan.

## Key Focus Areas

Research concentrates on aging mechanisms, regenerative therapies, and preventing age-related diseases.

## Future Outlook

Ongoing studies aim to develop safe, effective interventions to dramatically increase healthy years.



# Biological Mechanisms Affecting Lifespan and Health

## CELLULAR AGEING: KEY MECHANISMS

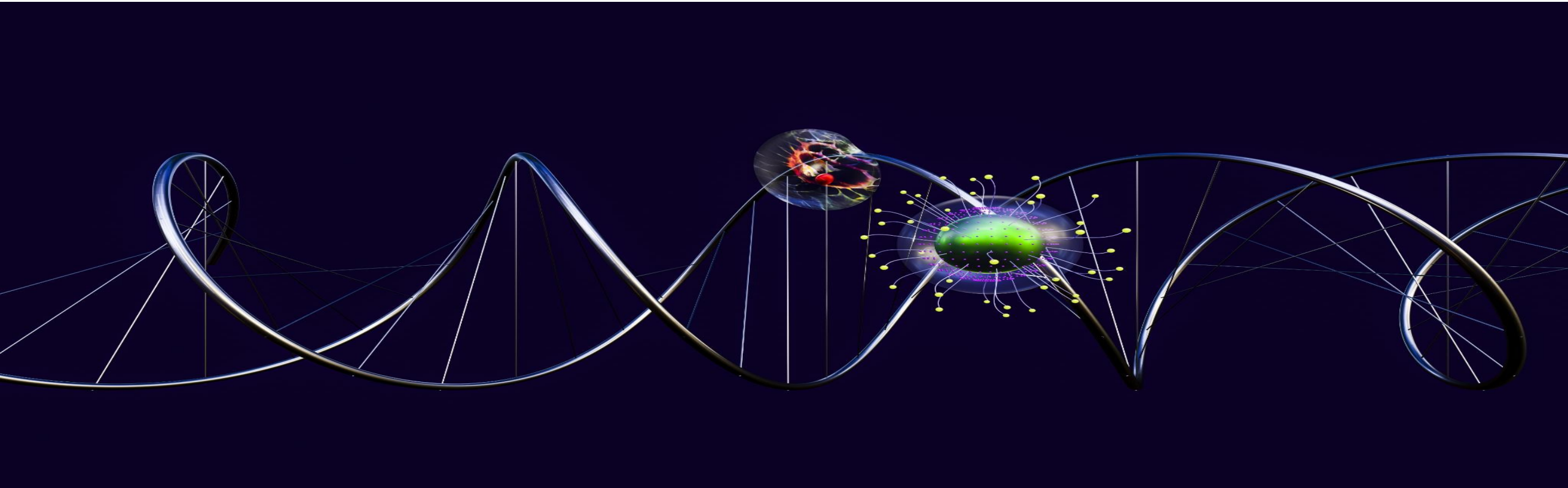
a) Telomeres shorten as cells divide, reducing regenerative capacity

b) DNA undergoes damage and imperfect repair

c) Mitochondrial efficiency declines, lowering energy productions

d) Senescent cells build up contributing to chronic inflammation

d)



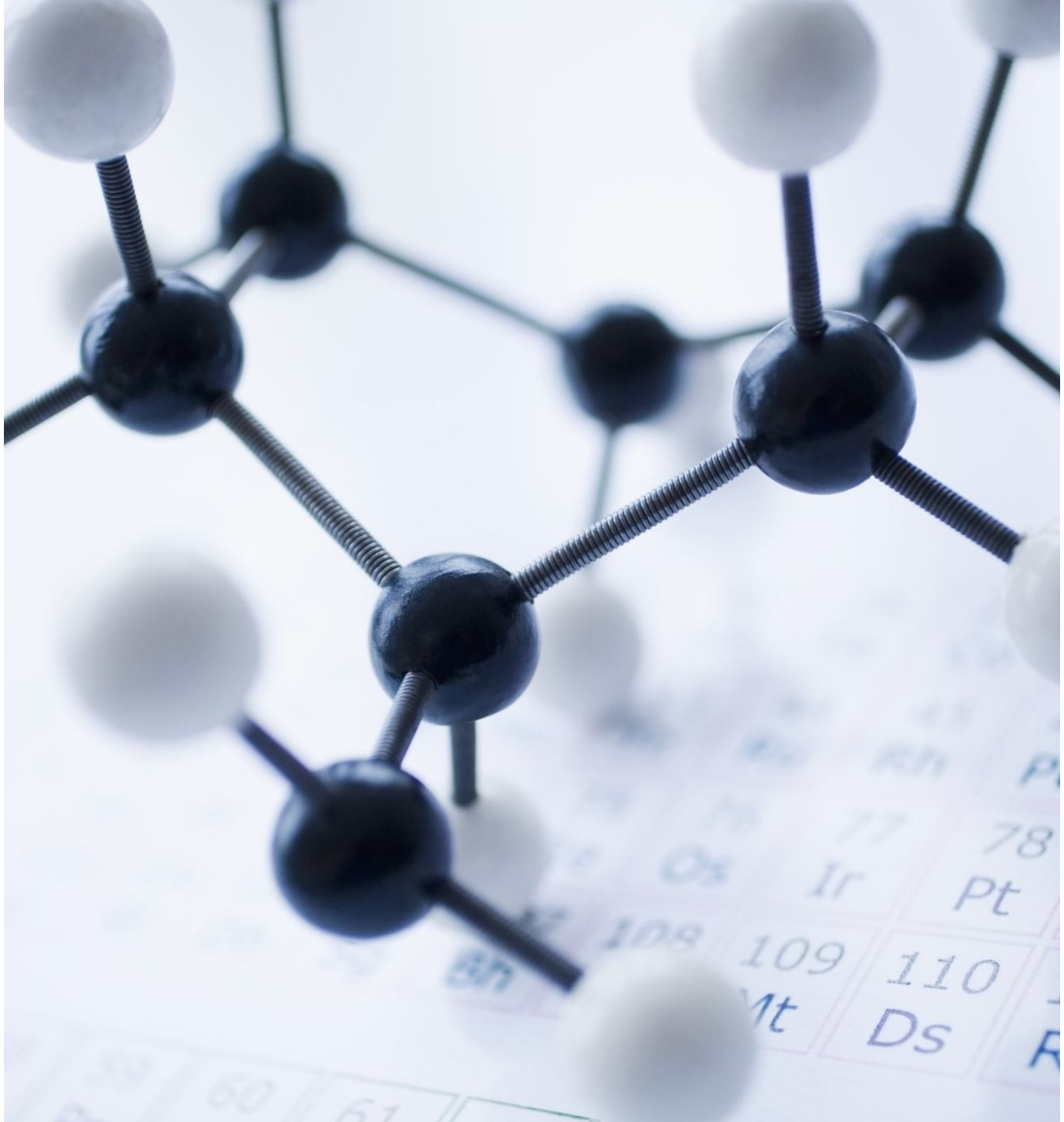
# 2022 SENOLYTICS THERAPIES

The development od Senolytic drugs that target and eliminate senescent cells promise improving health in older adults

Examples include **Dasatinib + Quercetin**, **Navitoclax (ABT-263)**, and **Fisetin**.

These compounds have shown senescent-cell clearance in preclinical models and early human studies.

- Senolytics:
- Targeting Ageing Cell s**enolytic therapies** are an emerging class of treatments designed to selectively eliminate **senescent cells**—cells that have stopped dividing but remain metabolically active and secrete pro-inflammatory molecules known as the **senescence-associated secretory phenotype (SASP)**. Accumulation of these cells is strongly linked to ageing and multiple age-related diseases.nih+1




# Gene and Epigenetic Therapies

**.EPIGRNETIC “reprograming” can reset ageing markers**

**.1.Yamanaka-factor-based approaches are explored for safe partial rejuvenation for safe partial rejuvenation**

**2. Epigenetic clocks now measure biological age rather than chronological age**

**3. Research aims to restore youthful function without triggering uncontrolled growth**

# Glossary of Regenerative Medicine

| | |
|---|---|
| **Regenerative Medicine** | A branch of medicine focused on repairing, replacing, or regenerating damaged or diseased tissues and organs. |
| **Stem Cells** | Unspecialized cells that have the ability to develop into different cell types and are fundamental to regenerative processes. |
| **Tissue Engineering** | A field that combines scaffolds, cells, and biologically active molecules to restore or replace damaged tissues. |
| **Bioprinting** | A technology that uses 3D printing techniques to create tissue and organ structures layer by layer. |
| **Cell Therapy** | The transplantation of healthy cells into a patient to replace or repair damaged tissues. |

# AI and Big Data in Longevity Science

### Data-Driven Insights

Leveraging vast datasets to understand aging processes and identify potential interventions.

### AI-Driven Discoveries

Applying artificial intelligence to predict health outcomes and personalize longevity strategies.

### Future Horizons

Innovations in technology are accelerating advancements toward healthier, longer lives.

# Current Medical Innovation

### Gene Editing Advances

Gene editing technologies like CRISPR are revolutionizing treatment options by allowing precise modifications to DNA, potentially curing genetic disorders.

### Artificial Intelligence in Healthcare

AI is increasingly used to diagnose diseases, personalize treatment plans, and streamline administrative processes for better patient care.

### Telemedicine Growth

Telemedicine expands access to healthcare services remotely, improving convenience and reaching underserved populations.

# mRNA Tech: From Vaccines to Therapies

**Expansion of Applications**

mRNA technology is now being explored for targeted therapies beyond traditional vaccines, offering potential treatments for various diseases.

**Innovative Therapeutic Strategies**

Researchers utilize mRNA to develop personalized and highly specific treatments, improving efficacy and reducing side effects.

**Future Impact on Medicine**

This advancement promises to revolutionize medicine by enabling precise, adaptable, and rapid-response therapeutic options.

# Ethical and Societal Considerations

| | |
|---|---|
| **Ethics** | Principles that govern what is considered right or wrong in human conduct. |
| **Societal Impact** | The effect that actions, innovations, or policies have on society as a whole. |
| **Responsibility** | The duty to consider the consequences of one’s actions on others and society. |
| **Bias and Fairness** | Ensuring that systems and decisions do not unfairly discriminate against any group. |
| **Privacy** | Respecting and protecting individuals’ personal information and data. |
| **Inclusivity** | Ensuring diverse groups are considered and included in decision-making processes. |

## HUGE ETHICAL DILEMMA SOCIETAL CONSIDERATIONS

.Longevity technologies may widen inequalities if access is uneven

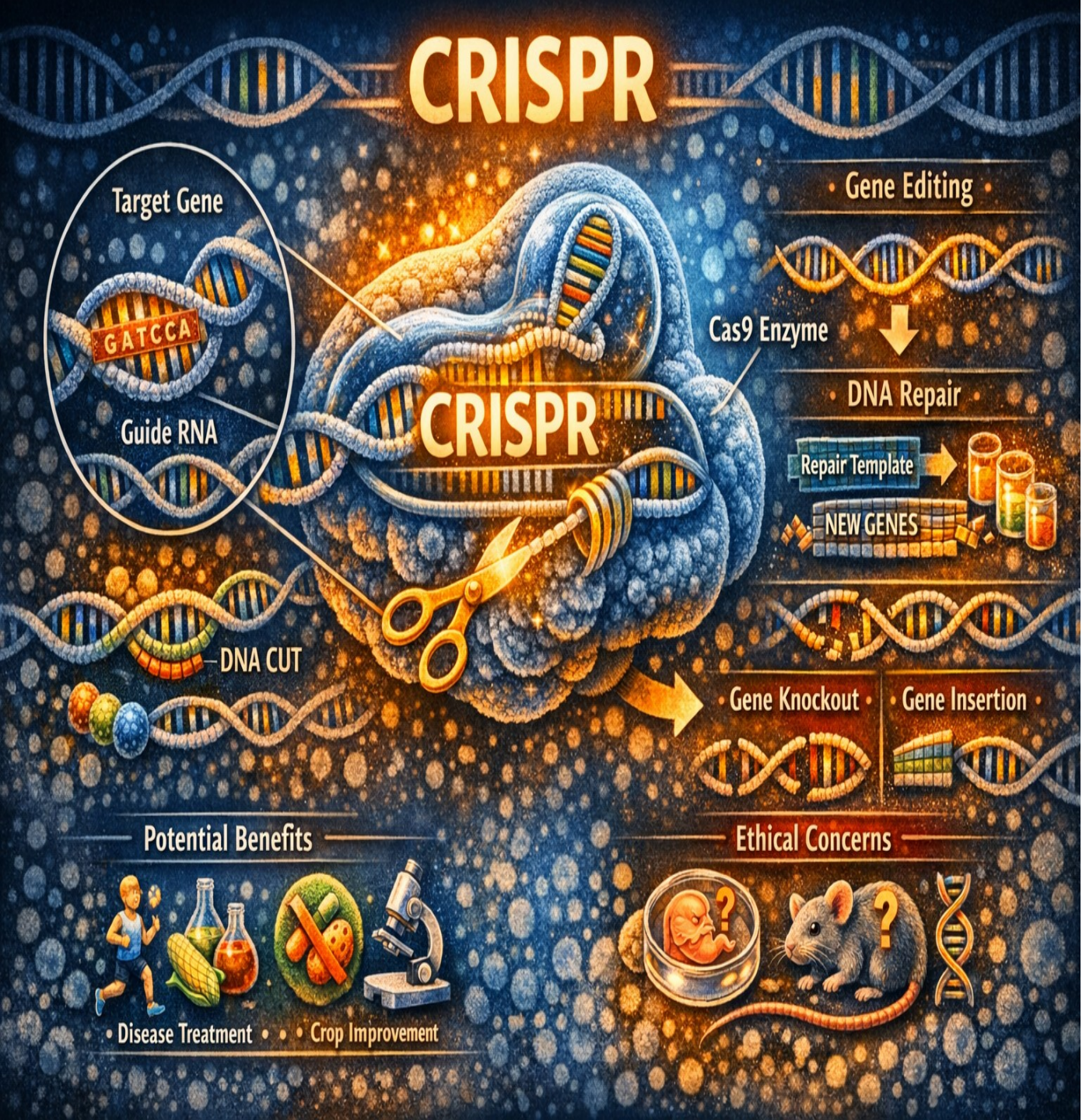
Extended lifespan raises questions about work, retirement and social structure

Healthcare systems must adapt to longer lives and chronic disease prevention

Ethical debate continues around enhancement vs therapy

# THE FUTURE OF LONGEVITY MEDICINE

- .Predictive Medicine may allow bespoke interventions decade in advance
- Therapies may not only slow ageing but potentially reverse aspect of it
- Intergraded care could support a “100-year healthy life”
- A shift from treating disease to sustaining resilience is underway




# 2025-2030

**Increased Focus on genetic editing technologies such ss CRSPR, to mitigate age related diseases**

# 2030-2040

Development of personalised medicine approaches, based on individual genetic profile

**2040-2050**

Integration of artificial intelligence in research to analyse large data sets related to aging.

# 2050 and Beyond

Exploration of Anti-aging therapies

Including senolytics and regenerative medicine

**My thanks to The President, Professor D.S.Matawal for giving me the opportunity to present the topic and my thanks to all fellows of the academy and members of the public for listening**



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