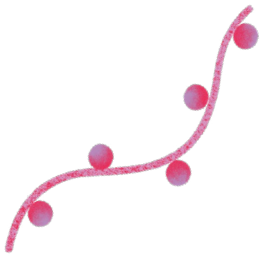
Behind the Scenes of Scientific Breakthroughs

UNIT 4 RECAP

Unit 4 focused on current research and breakthroughs in aging and longevity. Topics included learning about what happens to our cells as we age, the link between genome sequencing and lifespan, and how bioengineering and therapeutic cloning could be used to improve human health in the future. Once a scientific breakthrough has been discovered, the drug and treatment development pathway is a series of crucial steps that must be taken so that people can benefit from the discovery and live longer and healthier lives. Moving a new senolytic drug through this development and implementation pathway requires the collaboration of many different biomedical-related careers as well as important considerations, including answering ethical questions relating to lifespan and human health. New and innovative drugs and treatments in the field of aging hold the potential to not only extend our lives, but to improve our health as we age as well.

INSPIRATION 1

Senolytics aims to delay aging and extend longevity through new treatments, drugs, and biotechnology. For new drugs or treatments to be approved for human use, they first go through a series of extensive steps called the drug development pathway. This is time-consuming and expensive, with pre-clinical stages taking 3–6 years and costing potentially billions of dollars. AI is used to collect and sort through data in countless fields and industries, including biotech.



PROBLEM

Will the use of artificial intelligence in the creation of new anti-aging treatments change the way breakthroughs in longevity move through drug development pathways in senolytics and extend human lifespan faster than we imagined? What issues could this present in medicine, society, and sustainability?

SOLUTION DESIGN DRIVING QUESTIONS

What is the drug development pathway and what are the steps to approve a new drug?

What are the capabilities of AI in relation to drug development?

What types of drugs and treatments are at the forefront of the senolytics industry?

How is artificial intelligence changing medicine and the treatment of disease?

What challenges do we face if the human lifespan is extended in the coming decades?

RESOURCES

AI in drug discovery and its clinical relevance | PubMed Central | National Library of Medicine

How Artificial Intelligence is Revolutionizing Drug Discovery | Harvard Law | Bill of Health

Three Novel Anti-Aging Senolytics Discovered Using AI and Synbio | GEN Genetic Engineering & Biotechnology News

From Biological Aging Clocks to Longevity Medicine: an AI Odyssey | Institute for Experiential AI | Northeastern University

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INSPIRATION 2

As the field of anti-aging works to extend the human lifespan, the role that genes and our environment play becomes clearer. It is important to educate people about how exercise, food, sleep, employment, drug use, and health care all play into longevity and influence them to make informed choices. It's also crucial to provide access to places in all communities that can help prevent and treat issues that threaten health and longevity.

PROBLEM

What are the most effective ways to educate, encourage, and reward teens and adults to make medical, behavioral, and nutritional health-related choices that can help increase a person's lifespan?

SOLUTION DESIGN DRIVING QUESTIONS

What factors determine a person's longevity?

How can DNA and genes be used to calculate or estimate a person's lifespan?

Which populations or groups have the longest and shortest life expectancy?

What are the cultural, social, educational, and economic factors that contribute to a shorter than average life expectancy?

How do people get their information about health and medical-related issues?

What is the greatest influence on people who are making choices that will extend their lifespan?

RESOURCES

Genes and Longevity of Lifespan | PubMed Central | National Library of Medicine

Life expectancy by county, race, and ethnicity in the USA, 2000–2019: a systematic analysis of health disparities | PubMed Central | National Library of Medicine

What is Driving Widening Racial Disparities in Life Expectancy? | KFF

How do we best engage young people in decision-making about their health? A scoping review of deliberative priority setting methods | International Journal for Equity in Health

Eight Habits for Longevity: Life-Lengthening Factors Increase Lifespan by 24 Years | Neuroscience News

Identifying Credible Sources of Health Information in Social Media: Principles and Attributes | National Academy of Medicine