Anti-Aging: State of the Art

Felix Karg

22. Juli 2021

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

Felix Karg

- Computer Science (M.Sc.)

Goals for this Talk

You know ...

- what aging is
- why it is a problem
- why it is not necessary
- how it can be slowed down
- about personal anti-aging strategies
- how bioinformatics is helping research

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

Corona Deaths

Picture with distribution of deaths by corona

Other Deaths

Picture with death likelihood by cause and age

Conclusion: People die from age, not by other causes

Potential

Picture with potential years added by solving ...

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

Senolytics

Objection: but it's natural

(or: there is no way it could work)

Examples of old animals:

- sharks
- moles
- others
- and many more

Conclusion: it's not natural

Studies with Mice

and how much life got extended: living twice as long QUALY is possible

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

Hallmarks of Aging

- Telomere attrition
- Stem cell exhaustion
- loss of epigenetic information
- others ...

Core Pathways of Aging: in detail

Pictures and stuff about how the damage happens

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

Goal

Goal of anti-aging research: stop aging / neglegible senescence
intermediate goals: slow down aging, increase QUALYs

Potential strategies

Picture with blood exchange, senolytics, cellular reprogramming and others

full slide for each of them

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

Pharmacological

Some medicaments: Not medical advice!

Research!

A lot to be done, just see what you can do

Donate!

A lot of money is needed

Introduction

Why is aging a problem?

Is aging necessary?

What is aging?

How can we slow down aging?

What can I do?

How can bioinformatics help?

How can bioinformatics help?

Analysis

Simulation

Analysis

Large datasets, ever-more data

Analysis

Will need new tools and software

How can bioinformatics help?

Analysis

Simulation

Simulation

current Pharmaceutical battle: better simulator

Simulation II

AlphaFold2 and others

Sources i