Analyzing The Regulation Of Aging - A Brief Introduction

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- 'Aging is a physiological and irreversible, progressive process affecting cellular functionality, tissues, organs and the whole organisms thus finally causing death.' (*Höhn et al.*)

Definition

Why do we age?

Accumulation/Stochastic theory

- DNA damage (oxidative stress)

- Chromosomal telomere loss

- Mitochondrial disfunction

- Damaged or altered proteins

- Loss of stem cells

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Programmed theory

- biological clock (hormones, gene expression)
- Chromosomal telomere loss
- Mitochondrial disfunction

The regulation of aging

<u>Hypothesis</u>:

- certain genes/biological pathways influence aging

- their expression and interplay changes over time

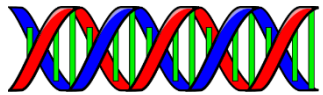# The regulation of aging

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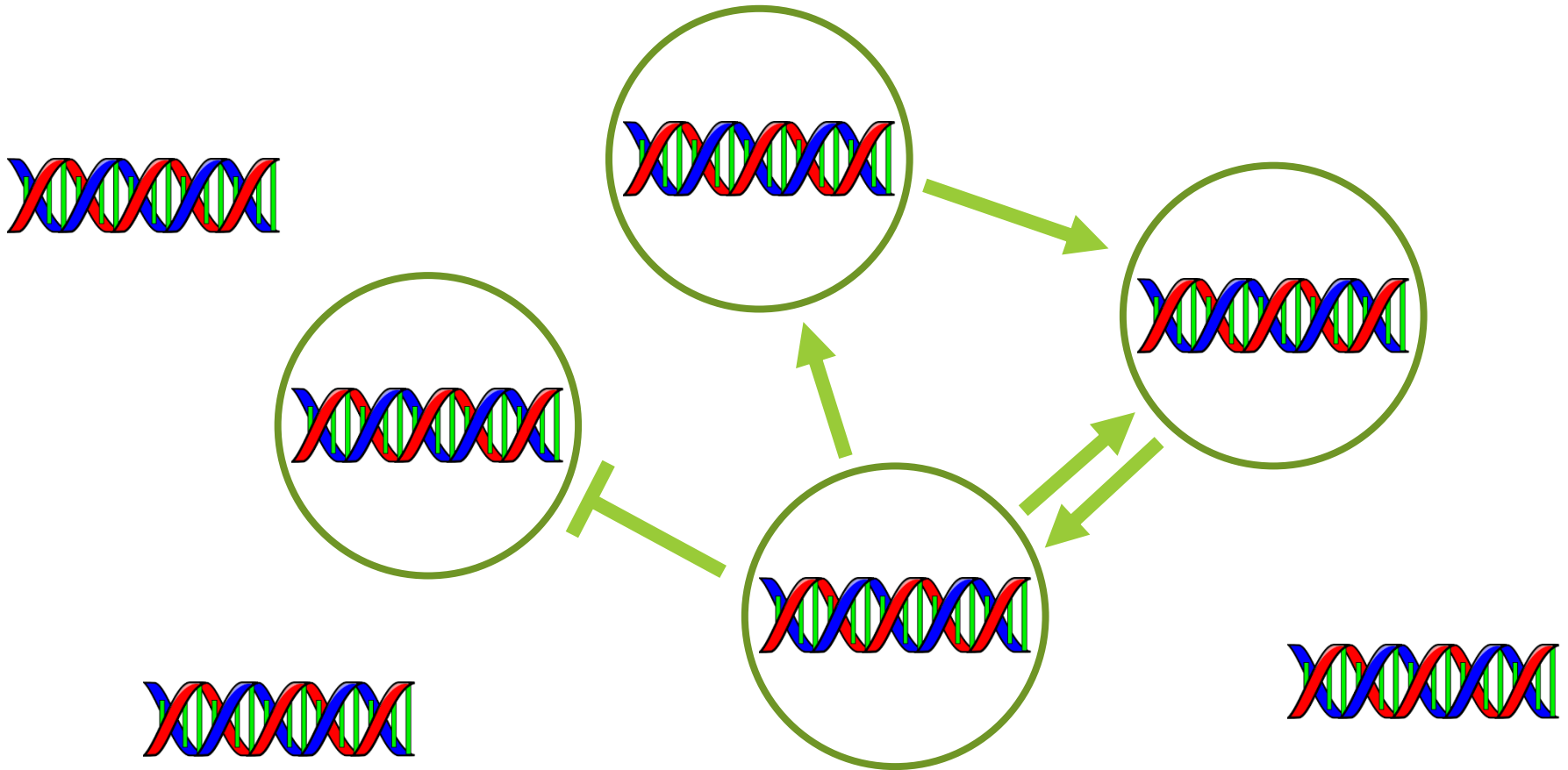
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Rough plan:

- transcriptomic investigation using RNA-Seq data

- genomic investigation of genes/pathways related to aging
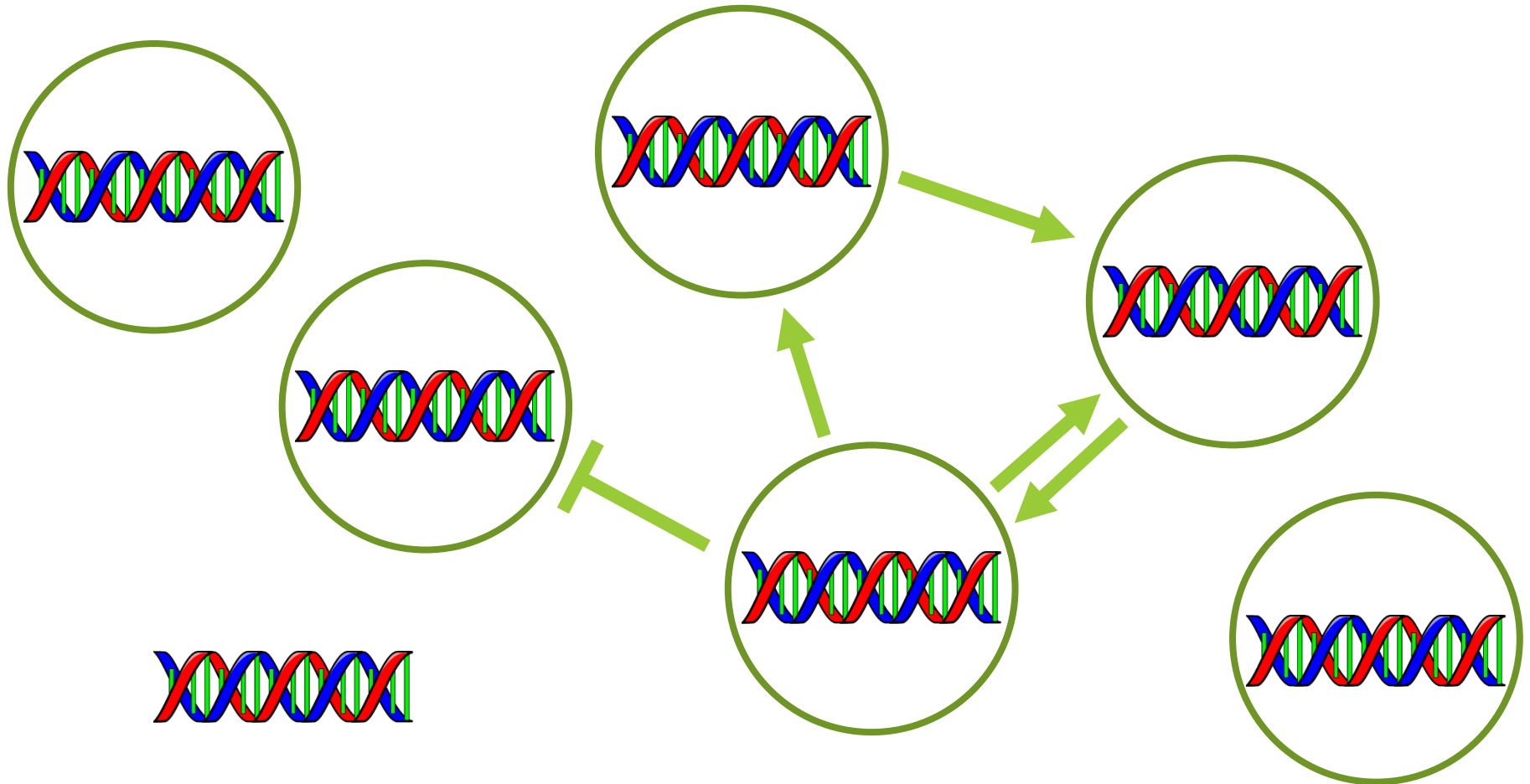
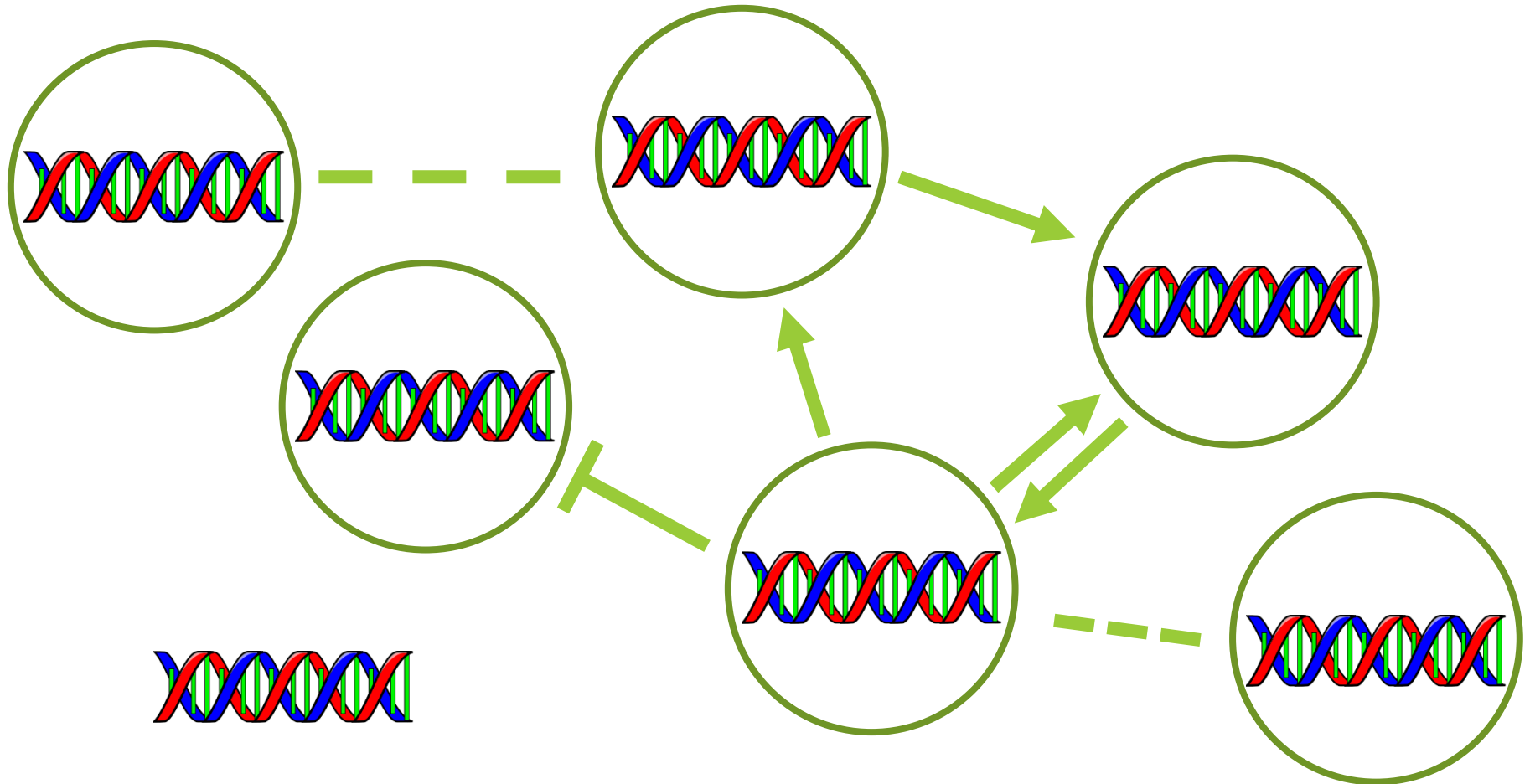- combination of results into a network-like overview
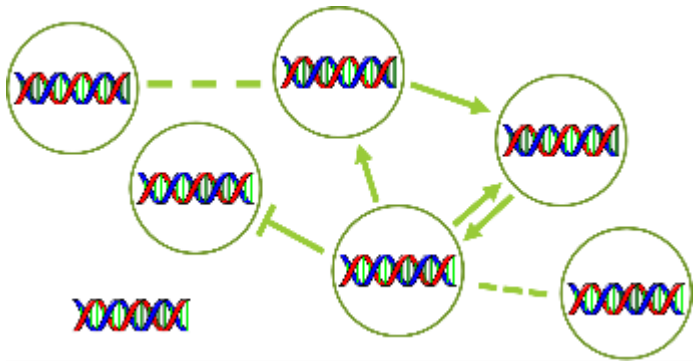
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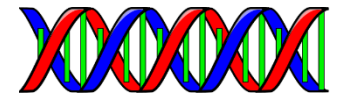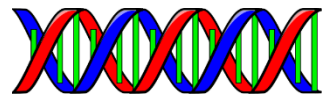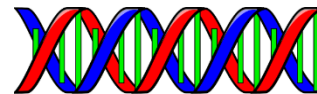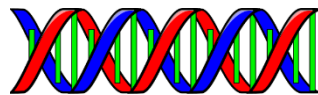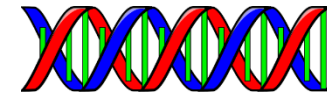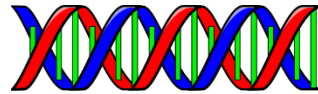
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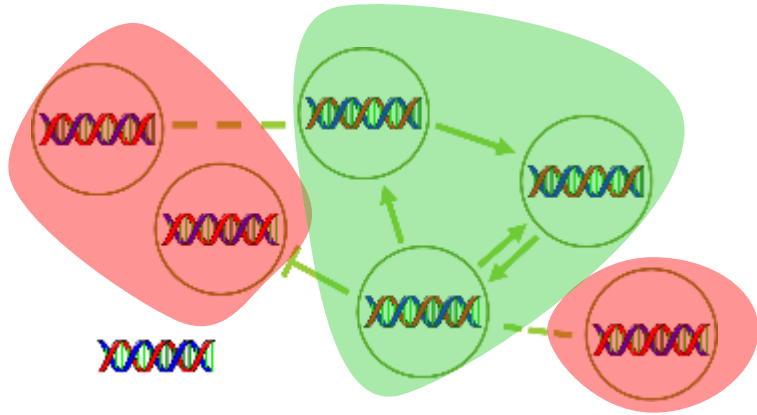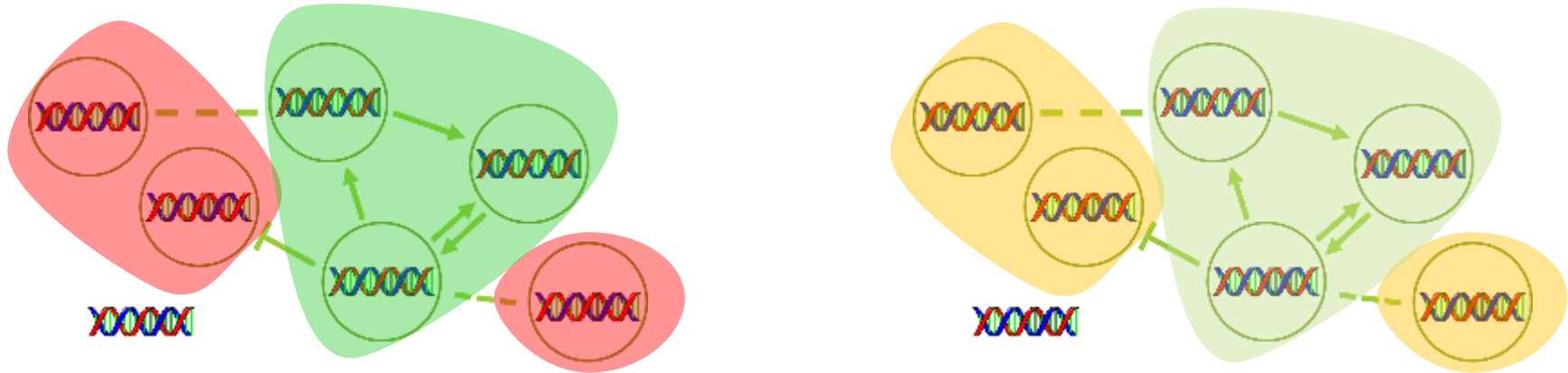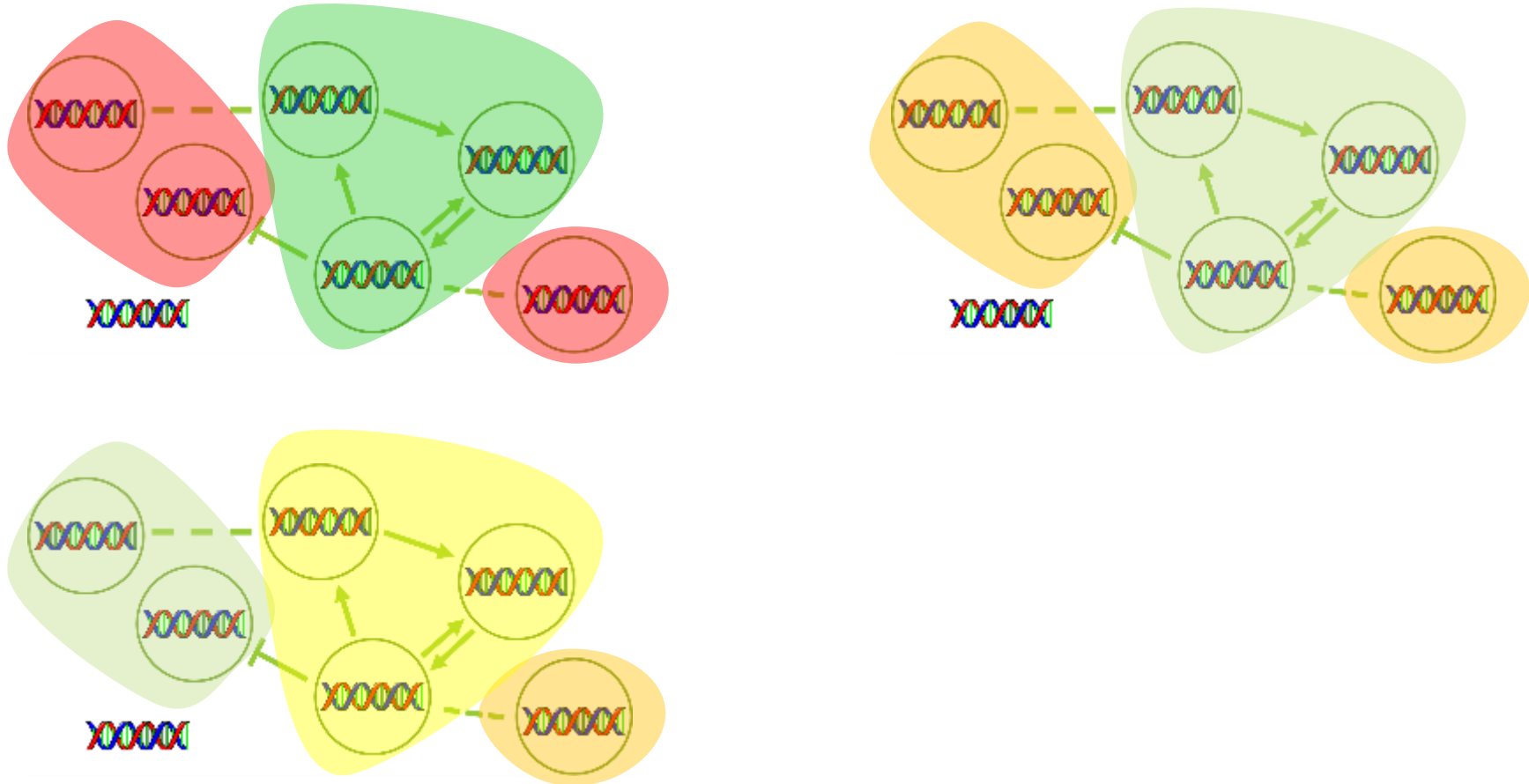
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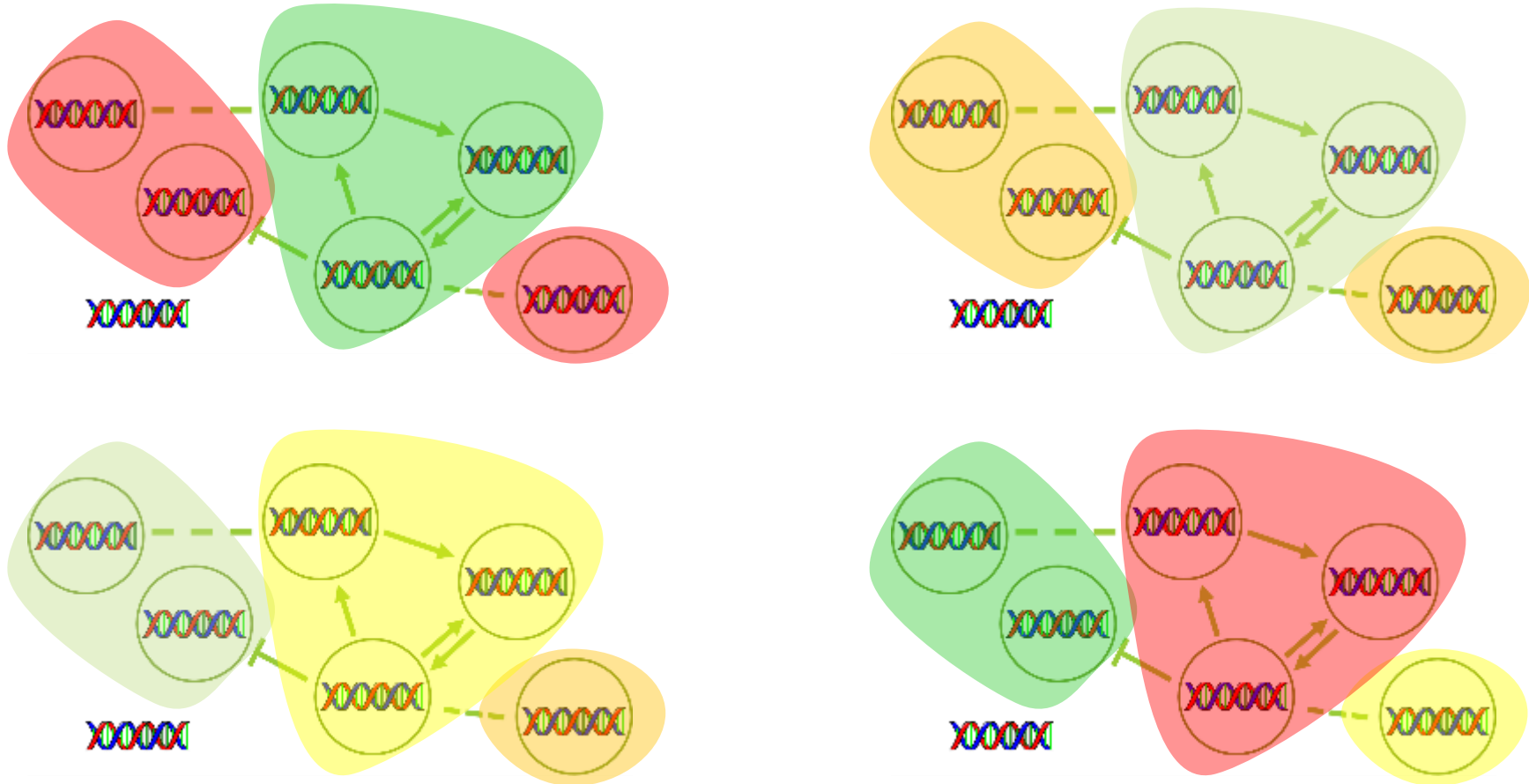
JenAge research center

- Jena center for systems biology of aging (est. 2009)

- Eleven research groups (FLI, HKI, FSU, UKJ)

The general JenAge objective is to gain new insights into the complex interplay of maintenance and repair networks that govern the lifelong accumulation of damage and finally lead to age-related diseases and death.

http://www.jenage.de/

JenAge: RNA-Seq data

Ages	Tissues	Stresses
24-29, 45-50, 60-65, 75-80 years	skin, blood	—
2, 9, 15, 24, 30 weeks	skin, blood, liver, brain	sport, diet
various ages	skin, blood, liver, kidney, heart	sport
5, 12, 21, 27, 29, 37 weeks	skin, blood, liver, kidney, heart	Rotenon
various ages	—	dauer state

Thanks for listening!

AFTER DECADES OF RESEARCH, PROF. LORENZEN FINALLY FOUND A WAY TO STOP AGEING.