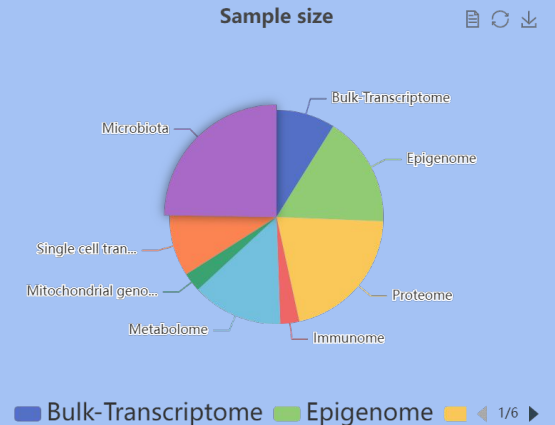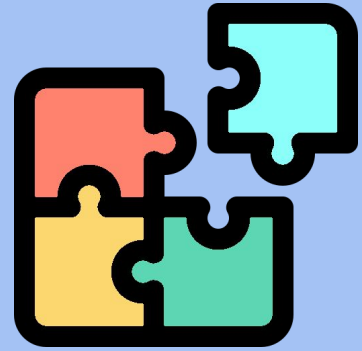# The AgeAnnoMo Database

Natalija Stojanovic & Charlotte Kaplan

Outline:

- <u>The purpose of the database is to provide information about different hallmarks of aging and how they impact different species.</u>

- This database focuses on providing a collection of age related data sets from a variety of larger databases.

- An explanation is provided as to why there is not a need for this database due to its lack of organization and amateur design.

Sample size

Microbiota
Bulk-Transcriptome
Epigenome
Single cell tran...
Mitochondrial geno...
Metabolome
Immunome
Proteome

Bulk-Transcriptome   Epigenome   1/6

AgeAnnoMo database is a multi-omics database for animal aging

~AgeAnnoMo database contains:

- 136 datasets from 8 different modalities
- 8596 samples from 50 species
- Over 1 million cells

| 136 Aging Datasets | 50 Species | 8596 Samples | 1M+ Cells | 12 Annotations | 10 Aging Hallmarks | 8 Modalities |

AgeAnnoMO was created by three universities

- University of Texas Health, West China School of Medicine, and Xidian University are the creators of this database, however it is unclear if individual students or these organizations actually maintain it.
- AgeAnnoMO has been created through human curation because the species and the datasets are handpicked.
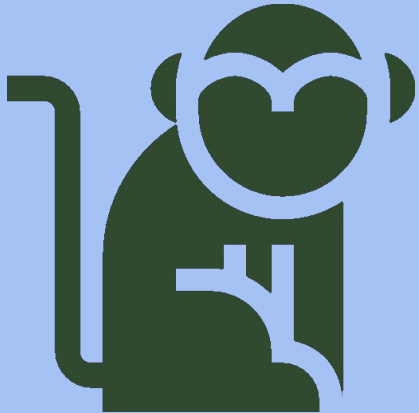
❖ It seems that a small lab group most likely put this database together, as this database seems to be a hobby, contributed to by three universities across the world. This database is limited in scope and does seem amateur.
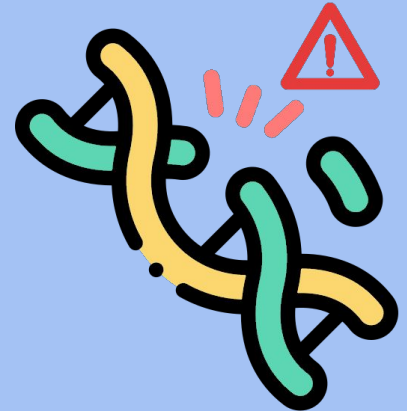
AgeAnnoMO's claim:

- Aging is a multifaceted process involving the progressive decline of biological systems at various levels.
- Twelve hallmarks have been identified as common factors contributing to aging. These hallmarks are conserved across multiple species.
- AgeAnnoMO is a comprehensive knowledgebase of multi-omics annotation for animal aging.
- AgeAnnoMO aids in identifying targetable biomarkers for aging research.
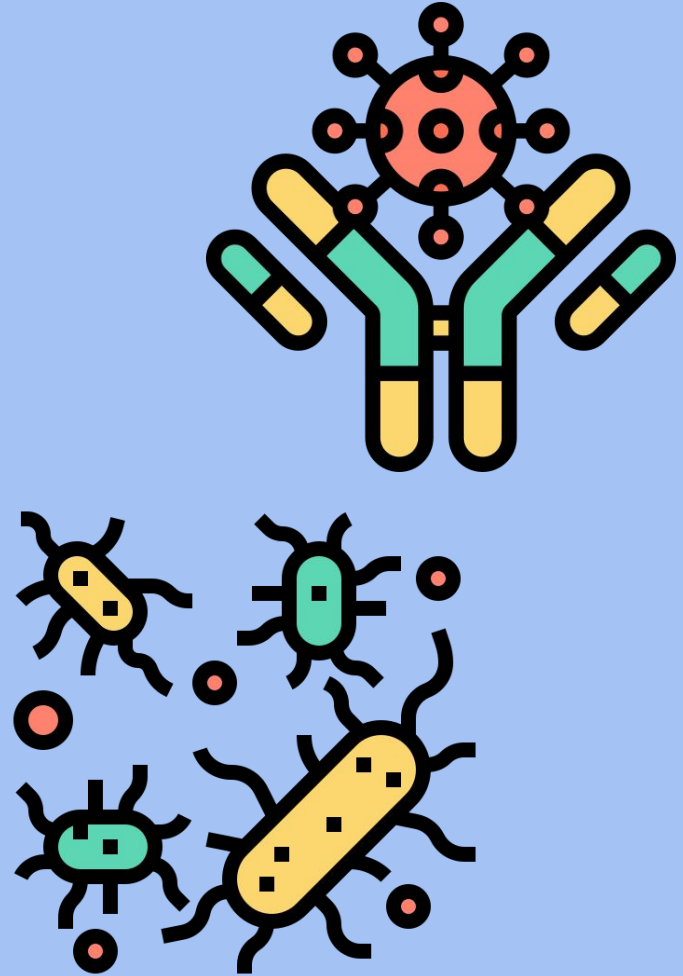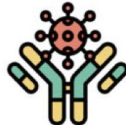
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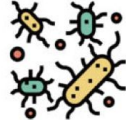
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Bulk-Transcriptome   Epigenome   ◀ 1/6 ▶
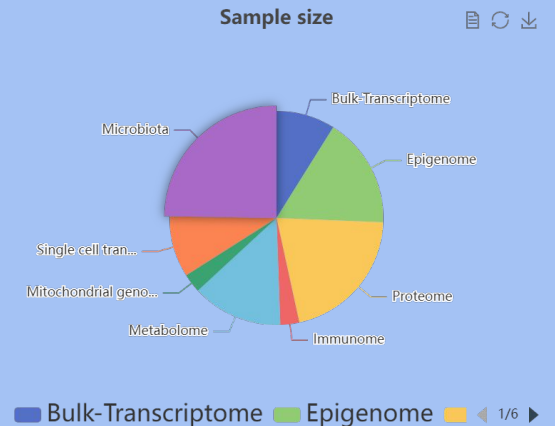
There are 11 hallmarks of aging for 20 species

- The database claims to cover 50 species, but when browsing the variety of species there is only 20 available.

**Browse by hallmarks of aging**

Genomic instability — Epigenetic alterations — Loss of proteostasis — Aging-related immune repertoire — Dysregulated metabolism in aging

Mitochondrial dysfunction — Altered intercellular communication — Dysbiosis in aging — Integration of aging hallmarks — Anti-aging interventions — Lifespan regulators

Browse by Species

Human — Mouse — Rat — Rhesus macaque — Drosophila melanogaster — Caenorhabditis. elegans — Chlorocebus aethiop — Danio rerio — Nothobranchius furzeri

What are the impacts of the AgeAnnoMo database to the scientific community?

- AgeAnnoMO provides information about the various age-contributing factors in different species

- Allows users to directly access different aging hallmarks or a particular species of interest

- It contains age-related genes, proteins, metabolites, mitochondrial genes, microbiota, and age-specific TCR and BCR sequences relating to aging for 50 different species.
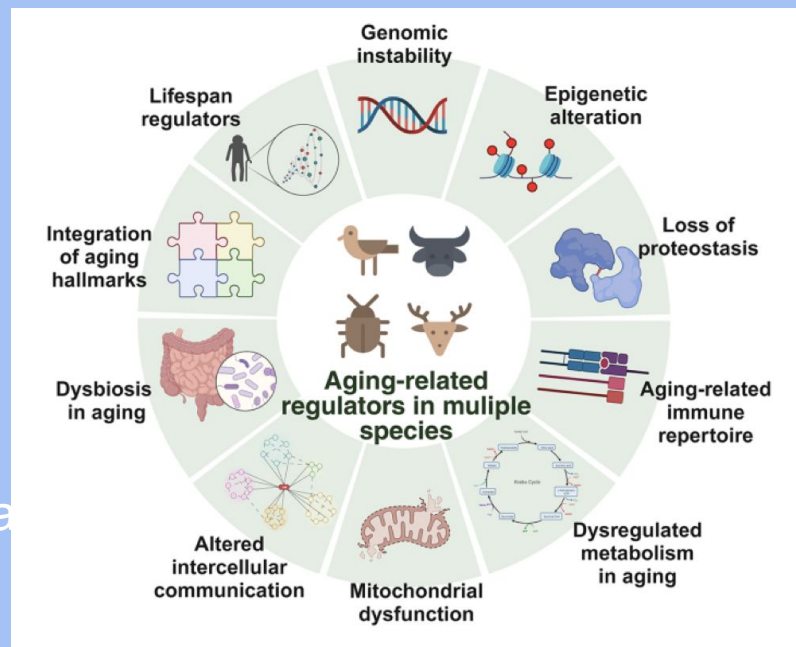
Data is collected from larger databases

- An example of a larger database would be NCBI and Uniprot

- Datasets are then organized using the AgeAnnoMo ID

Dataset ID ⇕	Species ⇕	Tissue ⇕	Project_ID ⇕	Sequencing_technique ⇕	Result Page
AMO-BT-001	Caenorhabditis. elegans	Whole body	GSE101964	RNA sequencing using Illumina HiSeq 2000	Detail

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Epigenome
Proteome
Immunome
Metabolome
Mitochondrial geno...
Single cell tran...
Microbiota

Bulk-Transcriptome   Epigenome   ◀ 1/6 ▶

This database is not reliable and unorganized
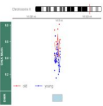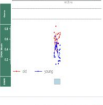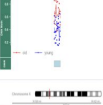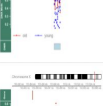
- The website appears to be well-organized on the exterior.
- When clicking on the subject of interest, the data is unclear. For many of the species, after clicking on one, very little information is given with no context.
- No other information is given, such as what the sequencing technique was used for, etc. This leaves users confused and with little information to analyze.

AgeAnnoMO

A knowledgebase of multi-omics annotation for animal aging
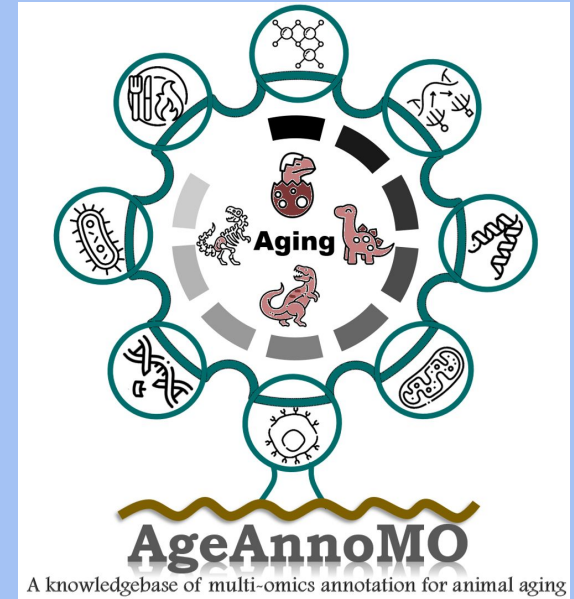
Uniprot_entry ⇅	Name ⇅	Category ⇅	P.Value ⇅	adj.P.Val ⇅	logFC ⇅	Up_or_down ⇅
O08992	SDCBP	old vs young	0.03046	0.2891	1.748	UP

AgeAnnoMO is not user friendly

- Nothing is hyperlinked.
- Data displayed is unclear.

- The data is not convenient to download, it comes in the form of excel files.

The database content is timely

- This databases is curated by in house staff, not community curation.
- AgeAnnoMO is a database available to the public.
- The database first went online in 2015.
- This database is updated yearly, with publications spanning from 2015 to most recently 2023.
- There has been nothing new in 2024 published.
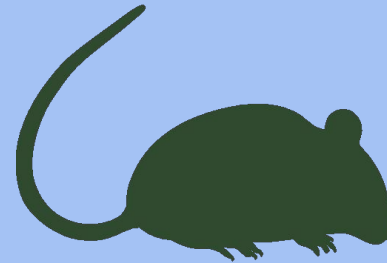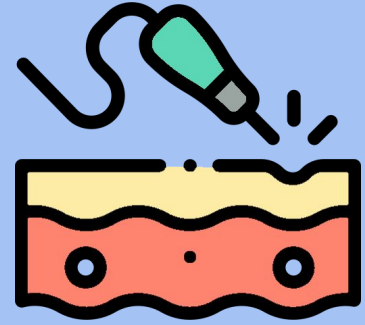
Summary

- Claims to be a useful resource to the scientific community, however, upon further evaluation it does not efficiently organize, simplify or organize data.
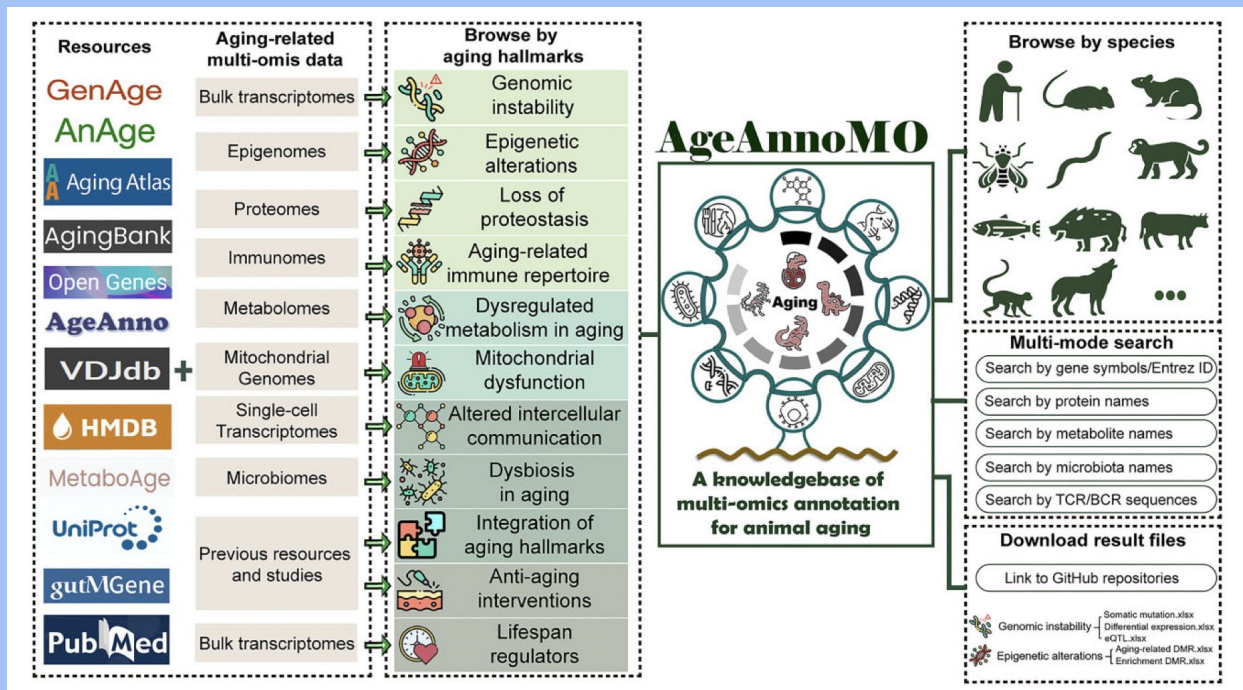
Acknowledgements:

AgeAnnoMO

https://relab.xidian.edu.cn/AgeAnnoMO/#/