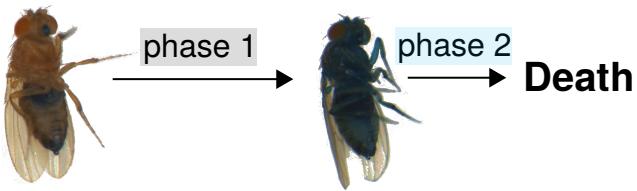


A

Classic framework

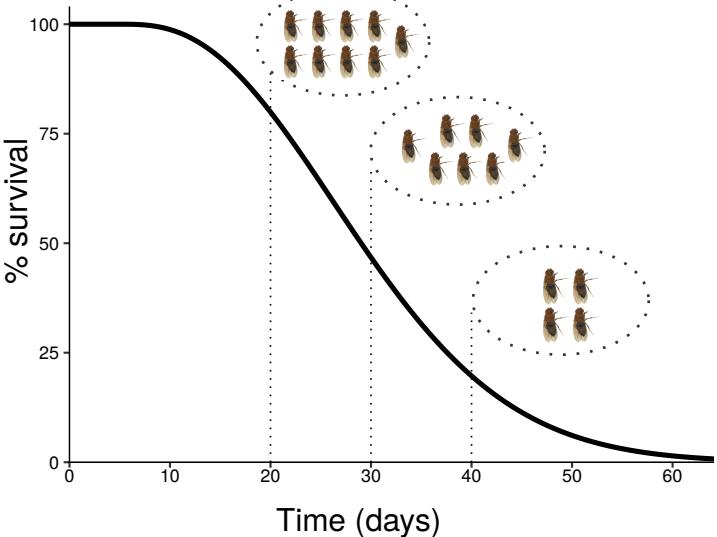


2-phase ageing framework

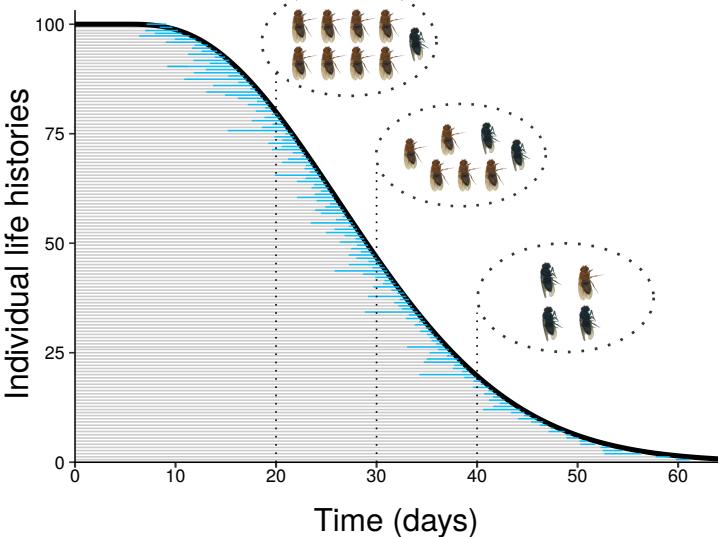


B

Chronological age

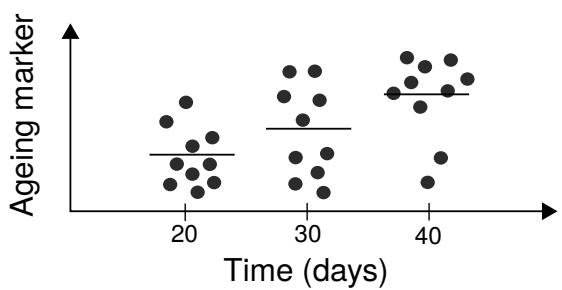


Biological age

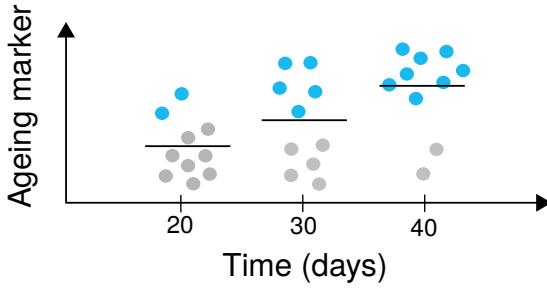


C

Population based



Individual centered

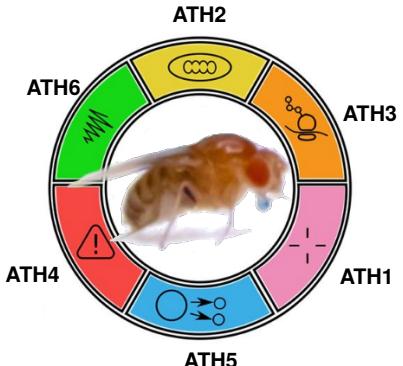


D

Ageing transcriptional hallmarks - ATH

adapted from (Frenk & Houseley, 2018)

Classical description



ATH1	ATH2
- - -	W W W
Dysregulation immuno genes	Downregulation mitochondrial proteins
ATH3	ATH4
! ! !	! ! !
Downregulates ribosomes	Stress (and DNA damage?)
ATH5	ATH6
! ! !	W W W
Reduction growth factor	Dysregulation gene expression

Smurf -based deconvolution

