Sharing genome-wide screening and RNA-seq experiments in reproducible data packages using R/Bioconductor

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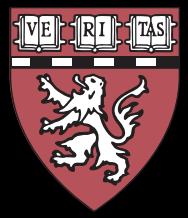
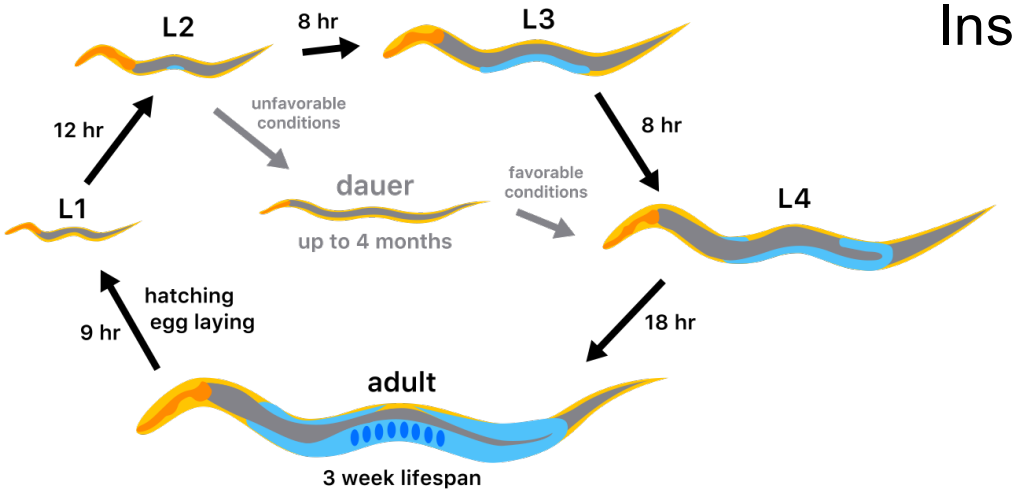
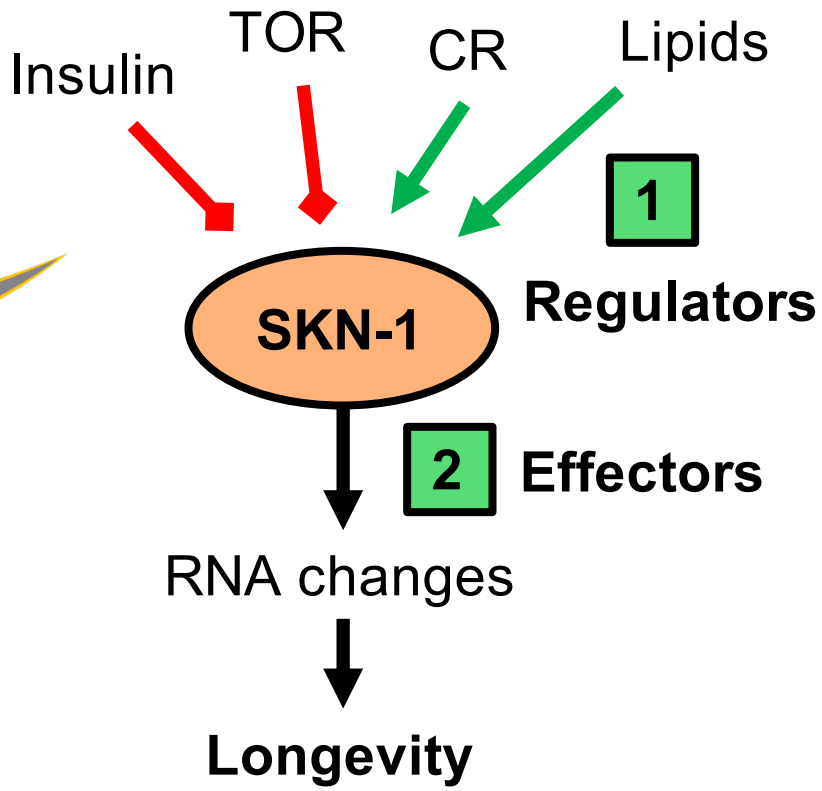
June 24, 2016



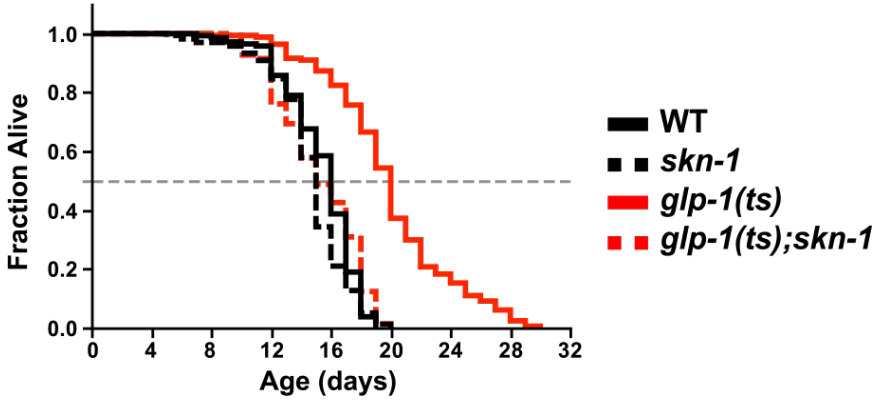
Using *C. elegans* to study the genetics of aging

Short life cycle – ***3 weeks***





Transcription factors control aging
(e.g. **SKN-1/Nrf**)

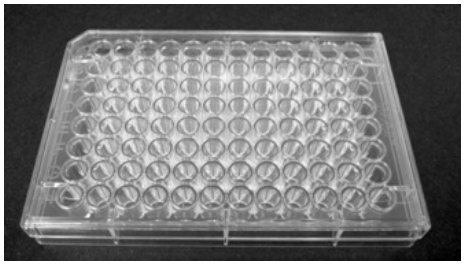


1st genome sequenced!
~20,000 genes, many conserved

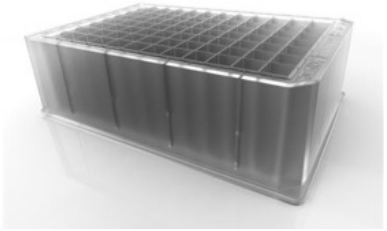
Blackwell et al., *Free Radic Biol Med* (2015)
Steinbaugh et al., *eLife* (2015)

Approach 1: Genome-wide RNAi screening

ORFeome Library
(RNAi plasmids in *E. coli*)



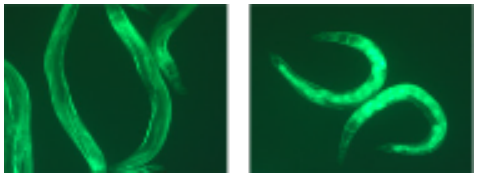
Culture clones



Feeding RNAi

bacterial lawn + worms

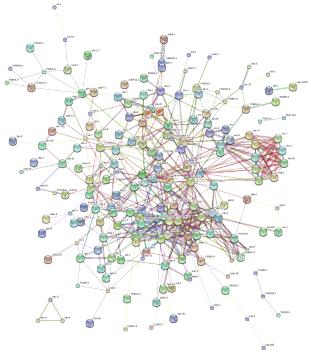
GFP scoring in vivo



transgenic reporter

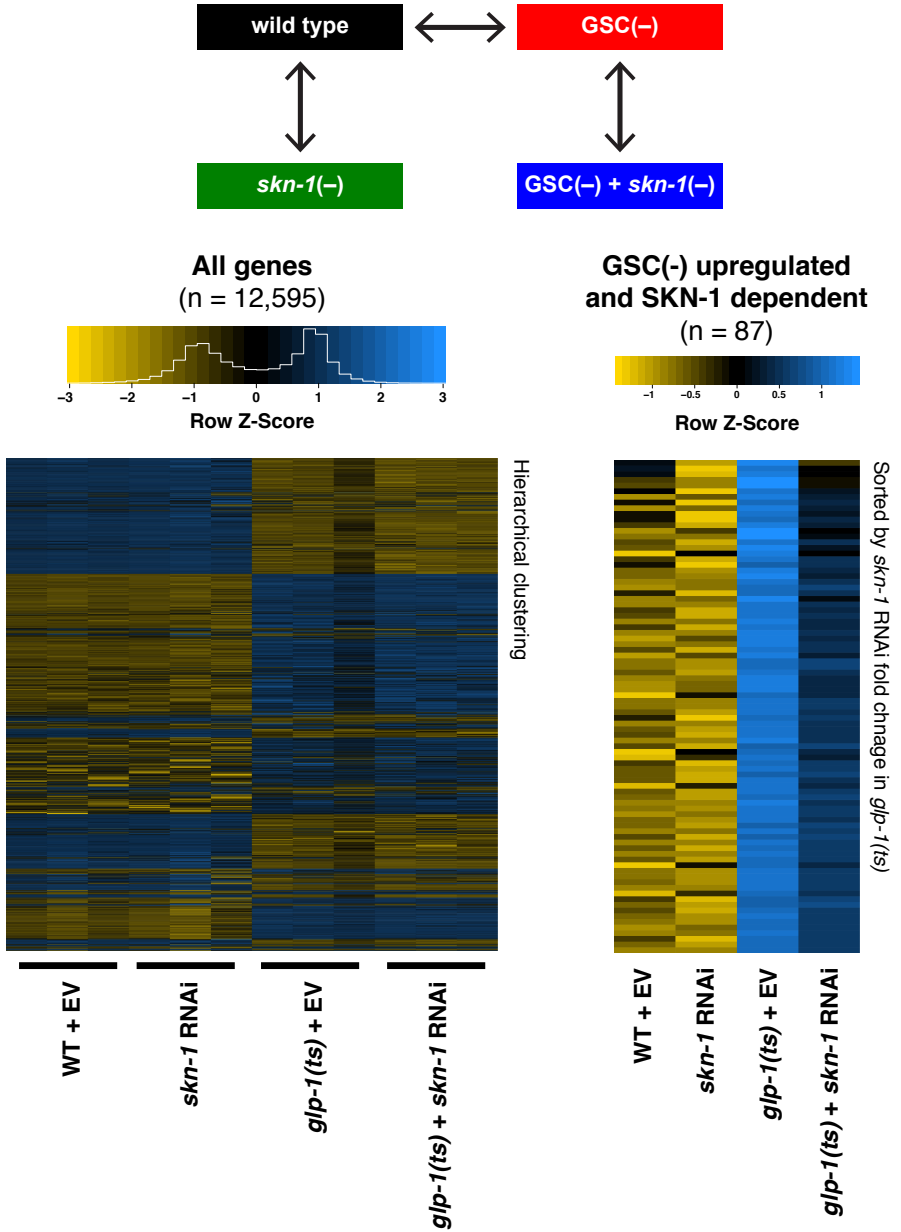
Filtering

R

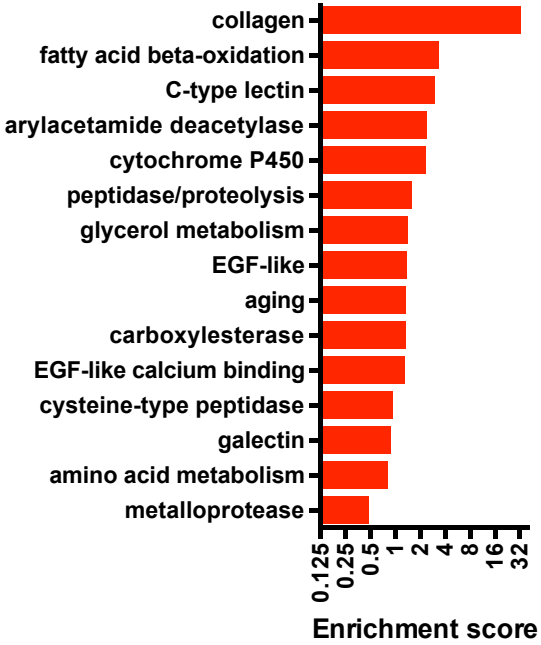


- Candidate genes
- Candidate pathways
- **New testable models**

Approach 2: Transcriptome profiling with RNA-seq



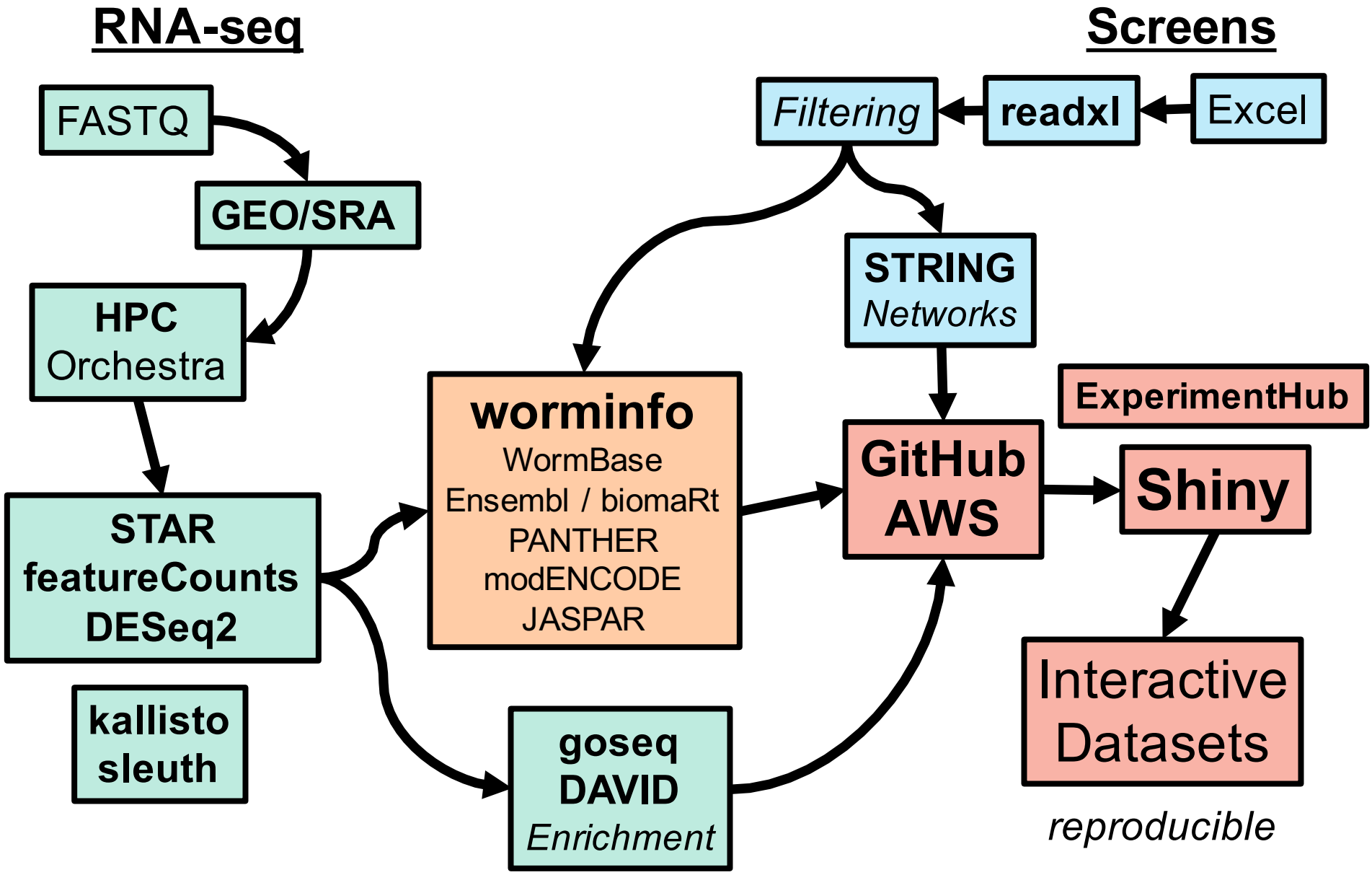
Gene enrichment



New methods:

- Tissue-specific
  GFP flow cytometry
- Single cell
  Drop-seq
- RNA splicing

Developing new tools for analysis and data sharing



Acknowledgements

Keith Blackwell
Jorge Castillo-Quan
Meltem Isik
Ziyun Wu
Peng Zhang

Genome Screening
Lorenza Moronetti
Magdalena Teufl

RNA Sequencing
Jonathan Dreyfuss, Joslin Core

Lipidomics
Charles Serhan, BWH/HMS
Justin English
Paul Norris
Meng Wang, Baylor
Chih-Chun Lin

Transgenics
Chris Link, Colorado
Shohei Mitani, NBRP

Funding
NIH / NIDDK T32 NRSA
NIH / NIA R21