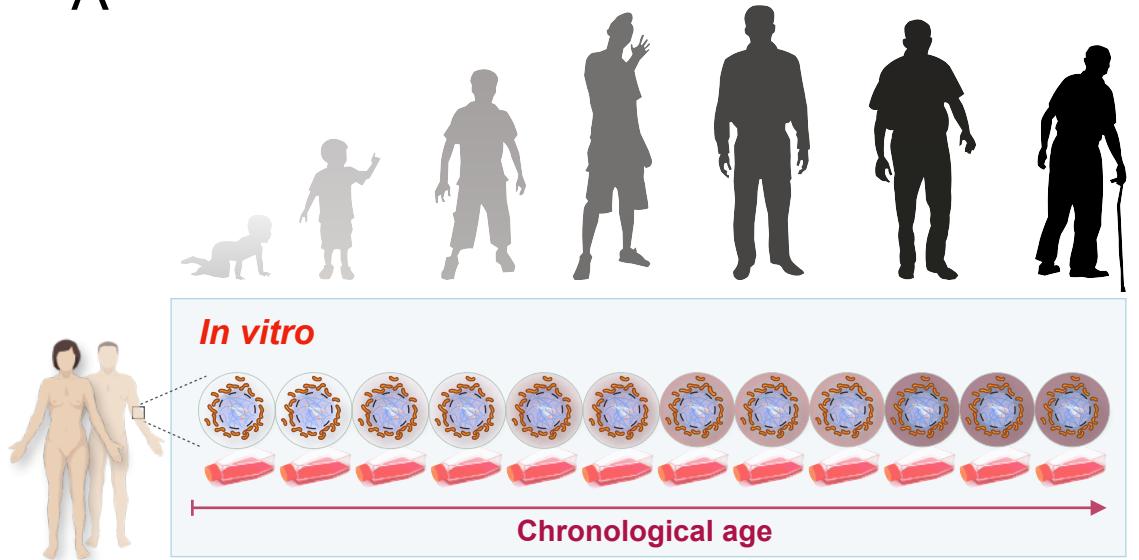


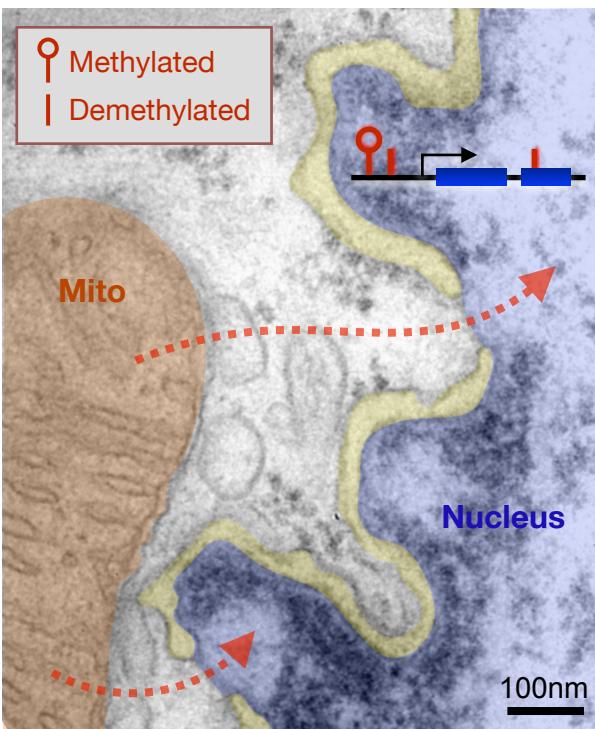
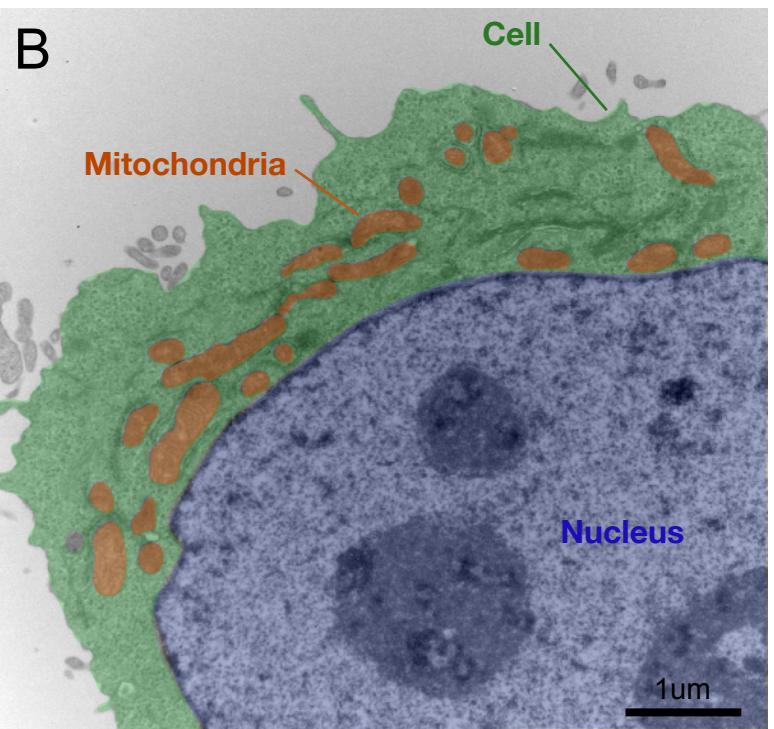
Privileged topological location of mitochondria near the (epi)genome

A

Cellular Lifespan System

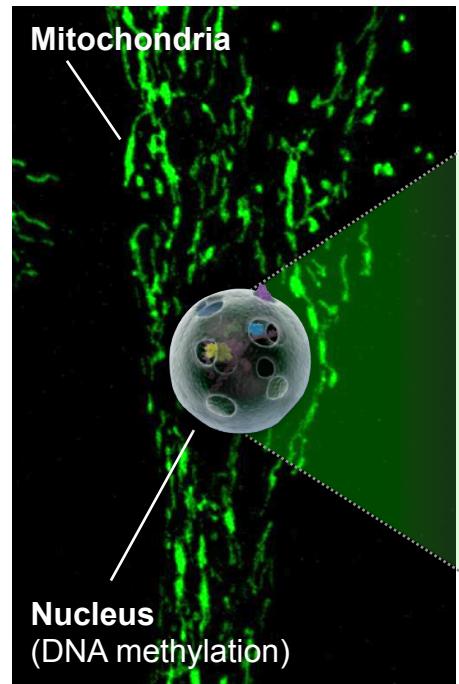


B

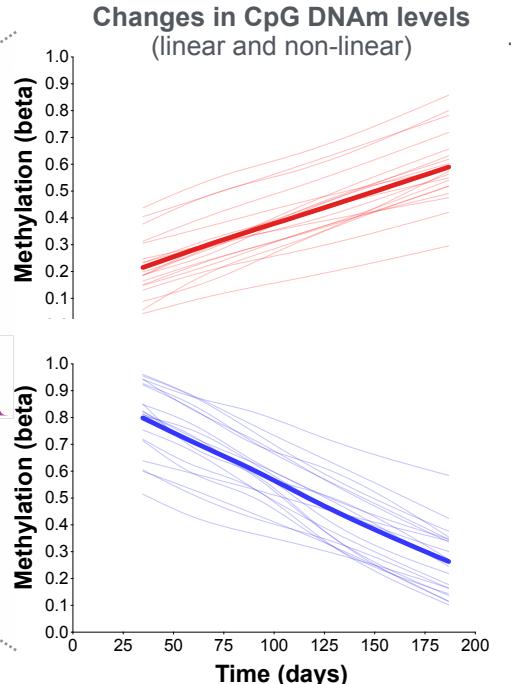


Example: DNAm changes in the cell nucleus, modeled from individual CpG and integrative clocks

C



Changes in CpG DNAm levels
(linear and non-linear)



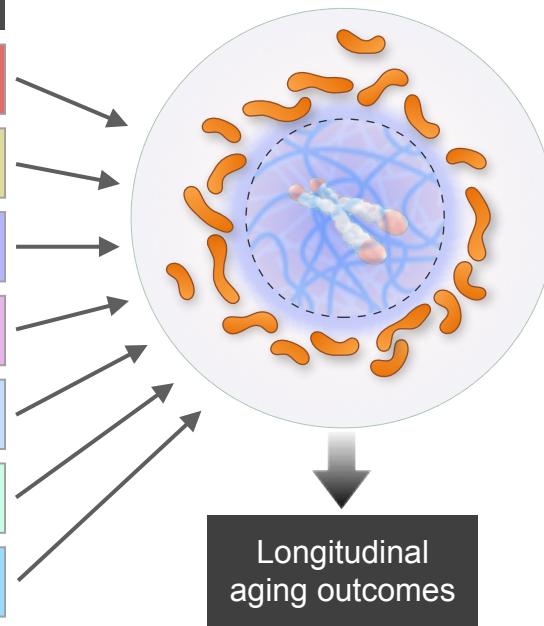
DNAm CLOCKS



D

TREATMENTS (n=22)

- Glucocorticoid stress (DEX)
- Metabolic modulators (mitoNUITs)
- Mitochondrial disease (SURF1 mutations)
- ETC Inhibitor (Oligo)
- Hypoxia (3% O₂)
- Glycolytic inhibitors (2-DG, Galactose)
- Others & treatment combinations



EXPERIMENTAL TREATMENTS
(enables causal modeling of age modifiers)