The mitochondrial basis of aging

- DNA mutations/Bioenergetics
- Inflammation
- Stem cell function
- Mitophagy and proteolysis
- Cellular senescence
- Activation UPR$^{mt}$
Access mitophagy using mt-Keima

- Excitation of Keima under neutral / acidic condition
- The ratio of fluorescent intensity is an indicator of mitophagy in living cells
Colocalization of “Red” mt-Keima with the lysosomal dye in cells
Aging results in a decline in mitophagy
Assessment of mitophagy in isolated cardiomyocyte and in the heart
Identification of genetic determinants and pharmacological modulators of mitophagy

Image-based high content screening for mitophagy modulators

Heat Map View of Assay Plate from LOPAC HTS: mt-Keima signal

- Genome wide CRISPR screens
- Image-based chemical screens

3,000+ Small Molecules from NCATS FDA-approved library

High content image based screening

Secondary Screening (20)

“MOA” “SAR”

WB validation (18)

“HITS” (40)

Neurogenesis (1) Lifespan (2) NSC self renewal (2) iPSC-Cardiomyocytes