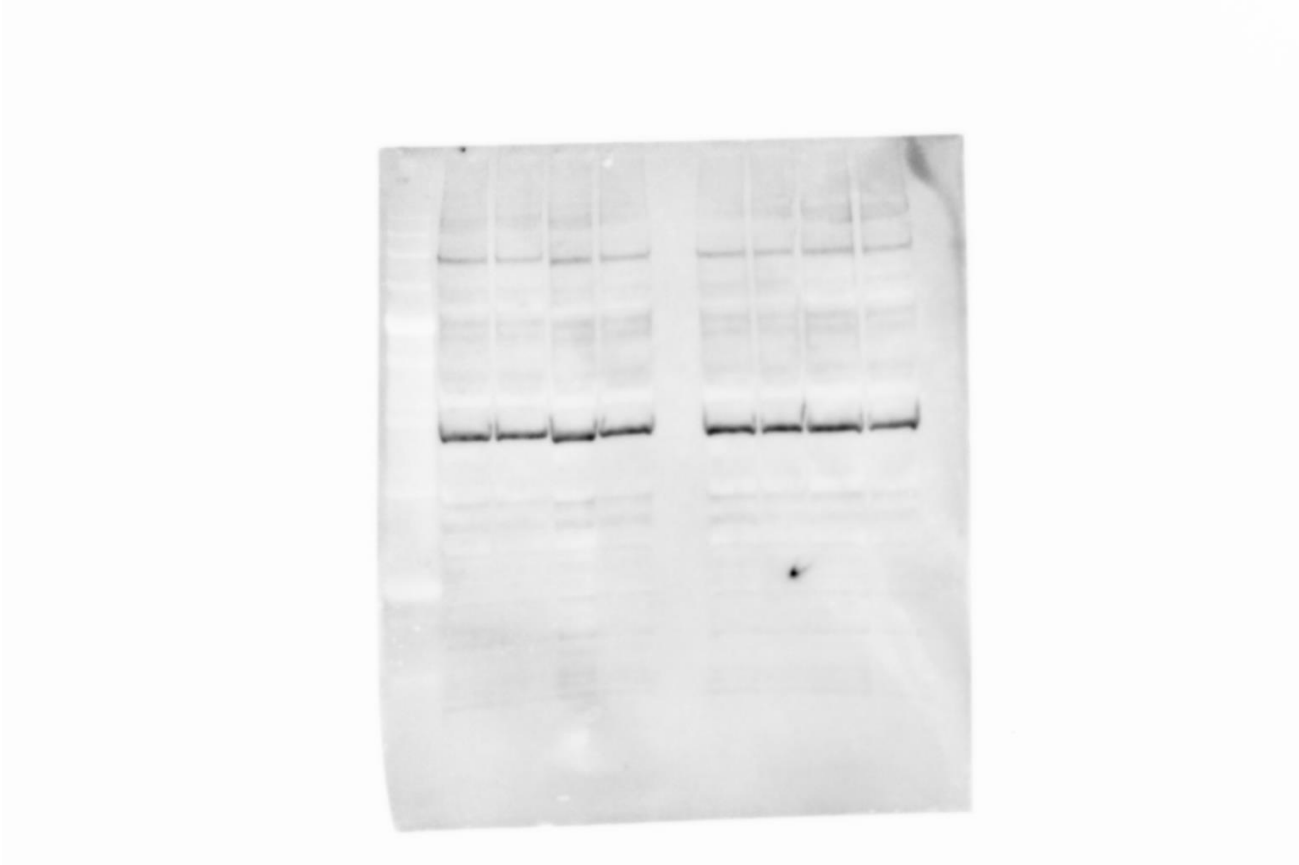


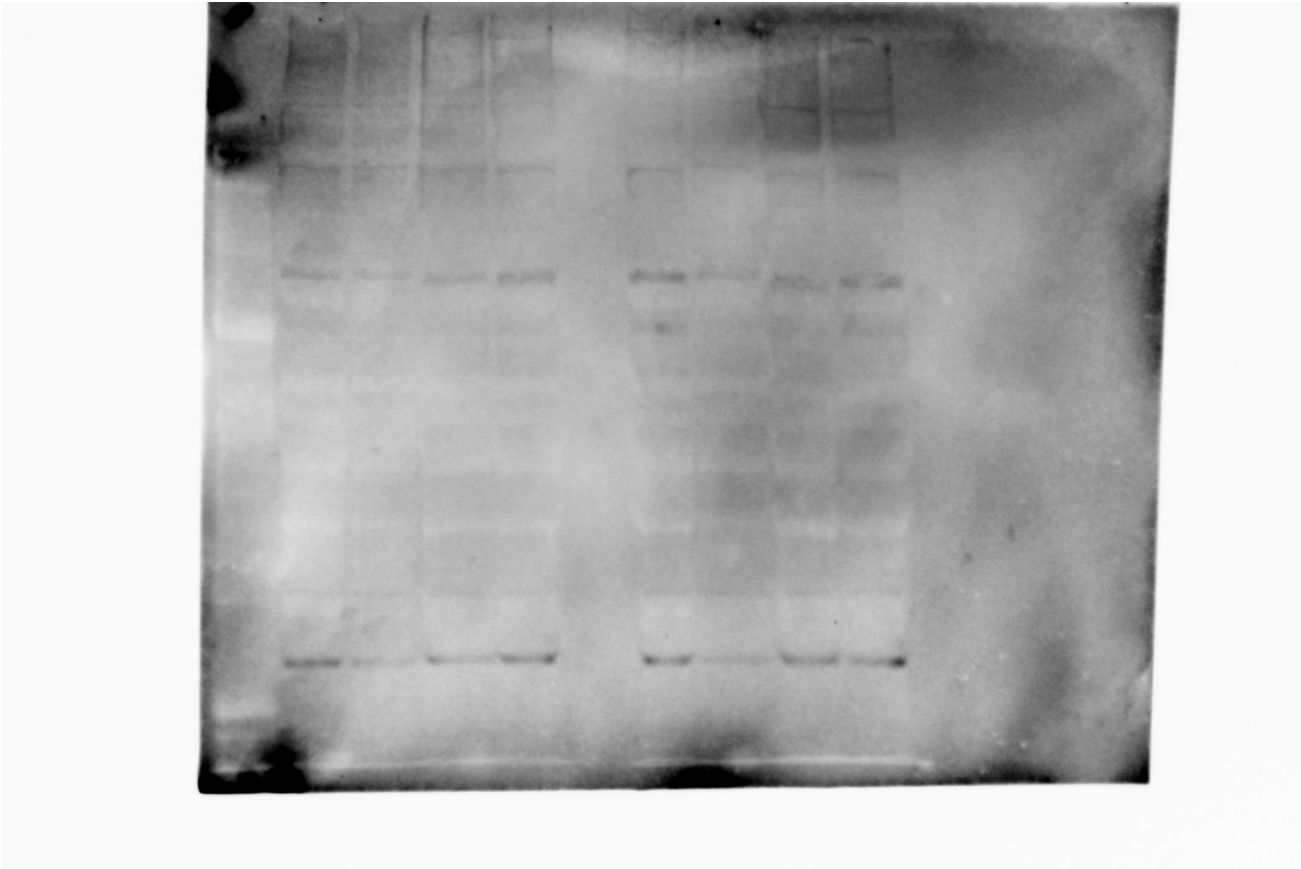
Supplementary Information

Supplementary Figure 1 Full-length Western blot images

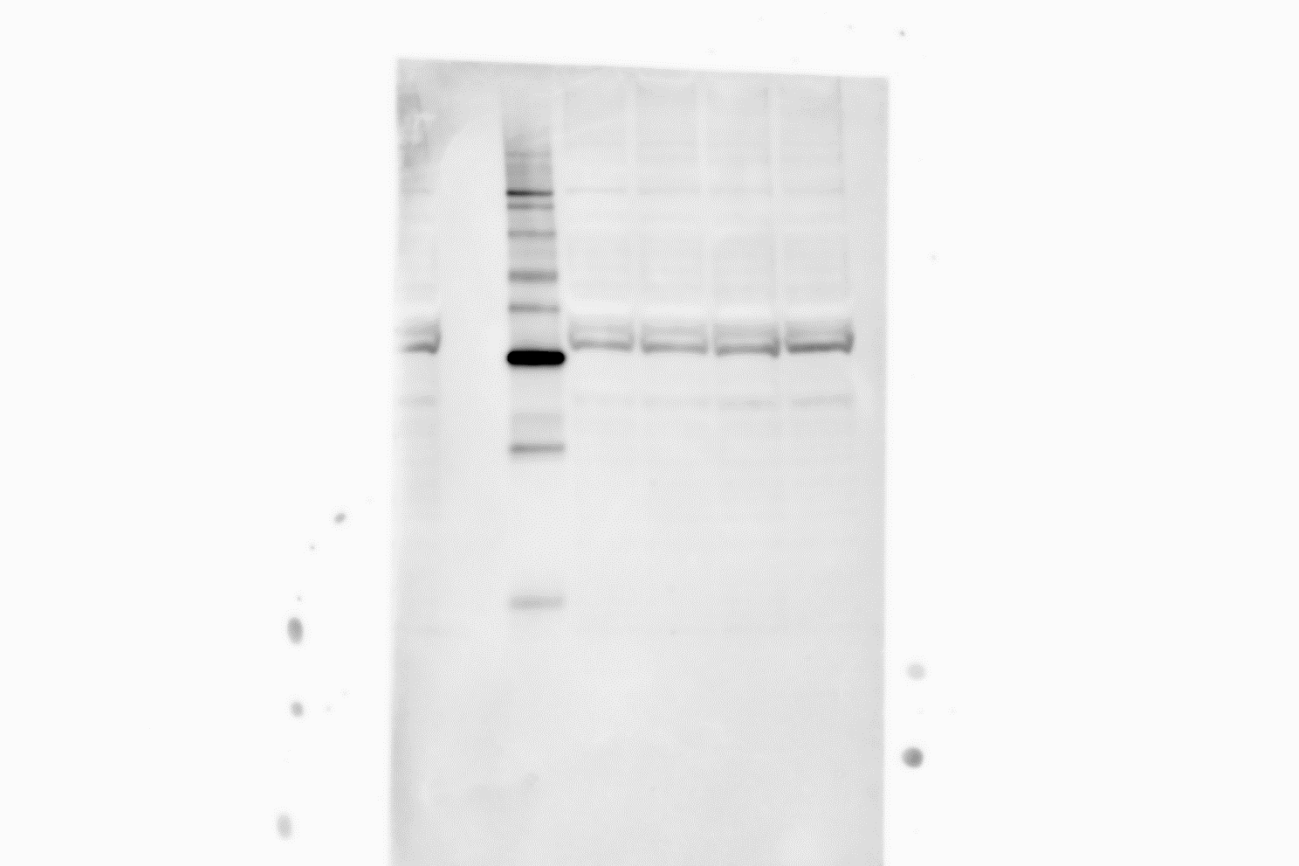
(a) Full-length blot image for SIRT1.



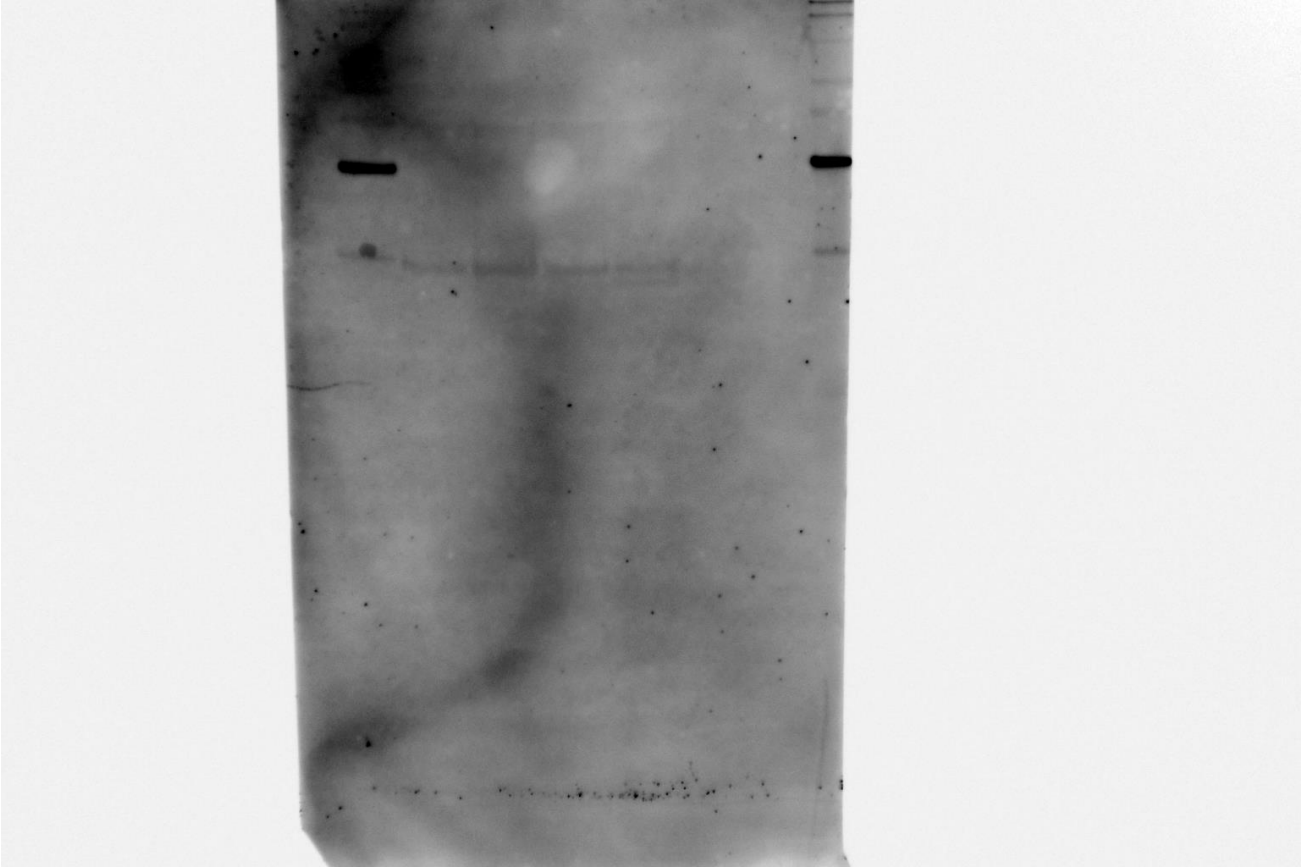
(b) Full-length blot image for PGC-1 α .



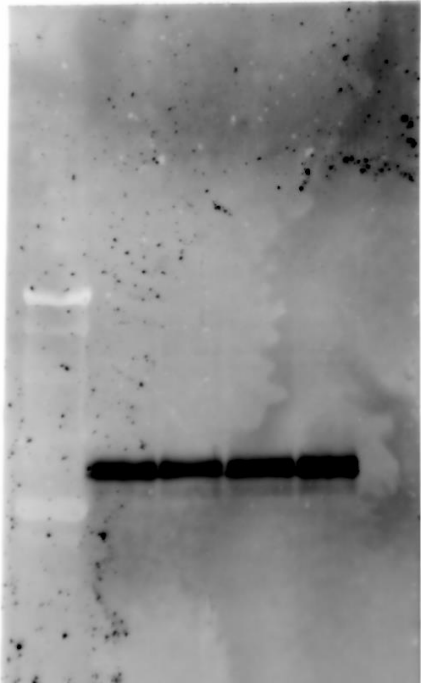
(c) Full-length blot image for β -actin.



(d) Full-length blot image for acetylated-lysine (immunoprecipitation).

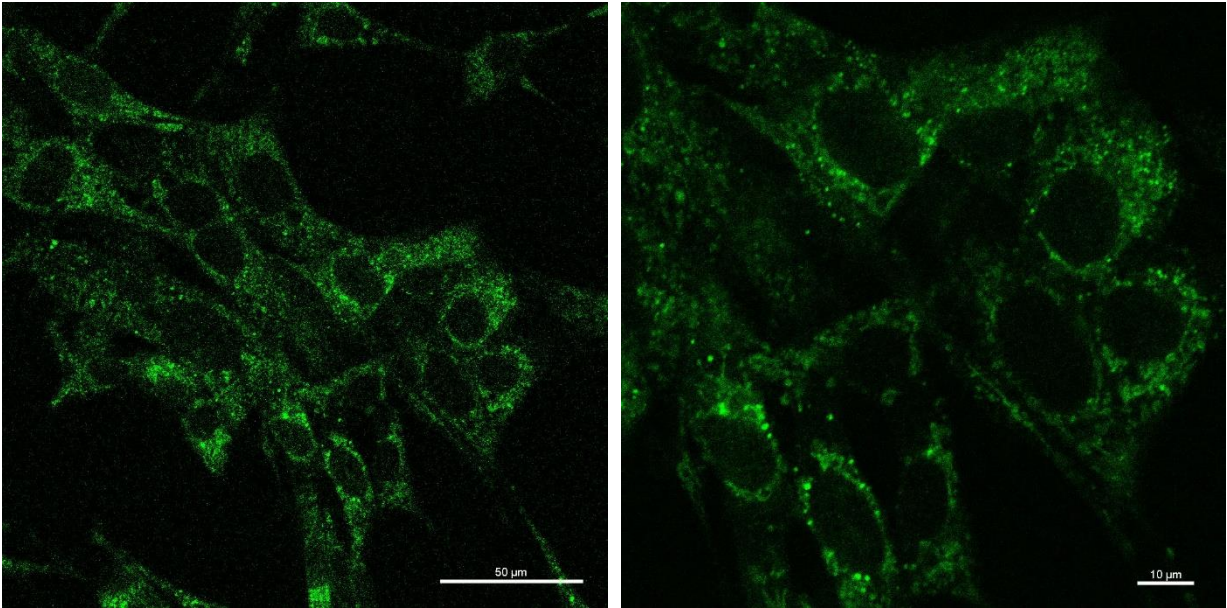


(e) Full-length blot image for PGC-1 α (immunoprecipitation).

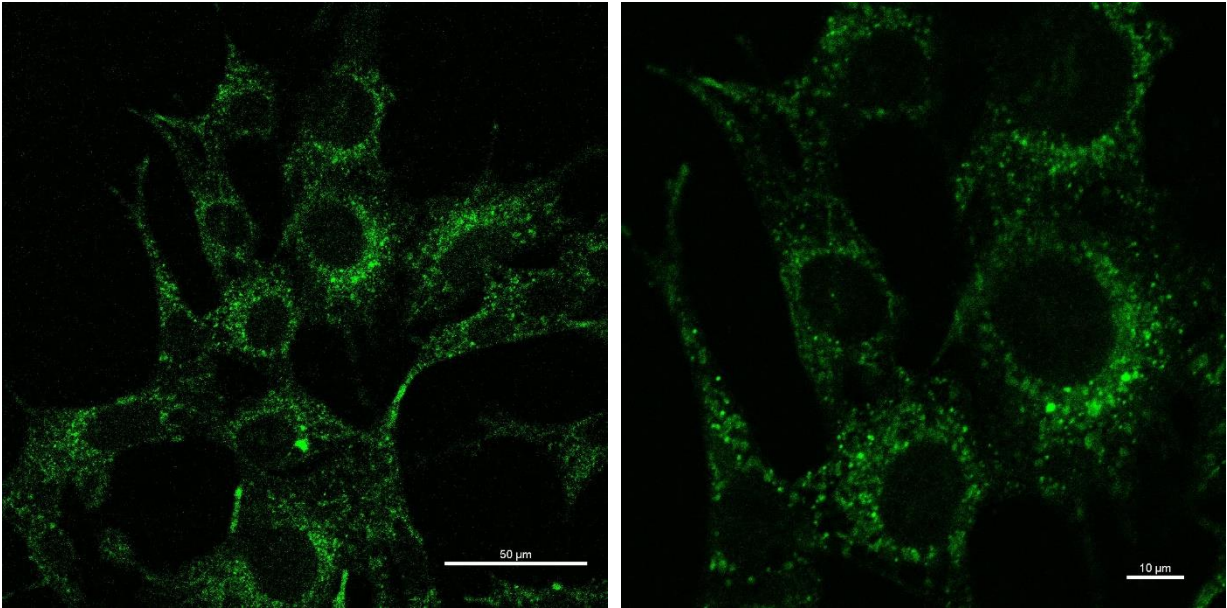


Supplementary Figure 2 SPiDER-βGAL microscopic images.

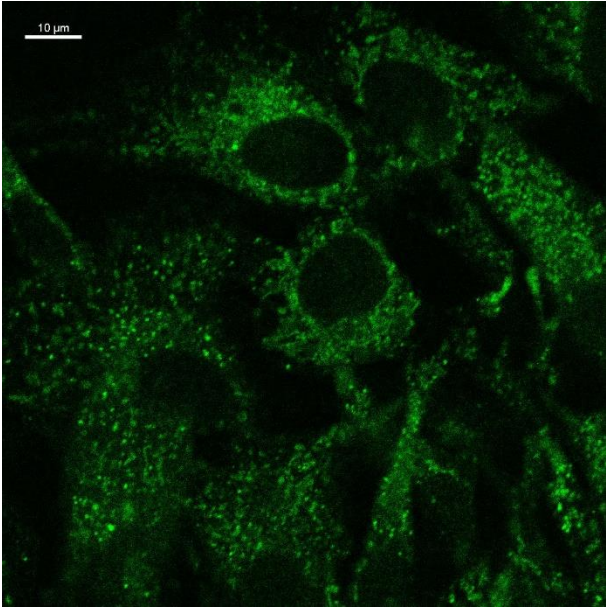
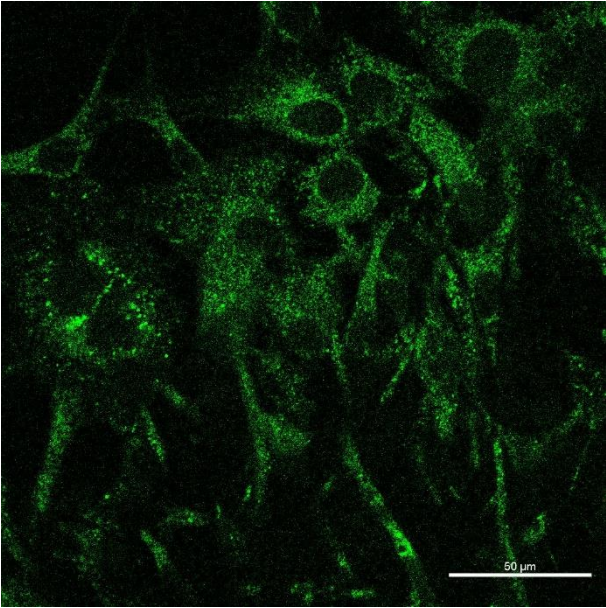
(a) Control group



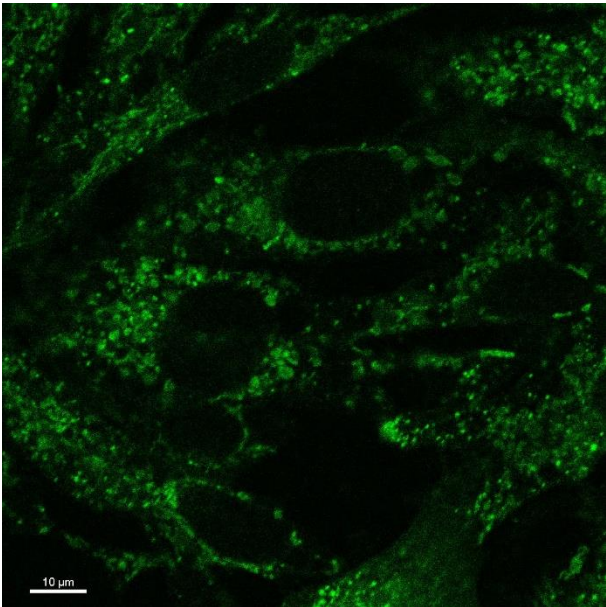
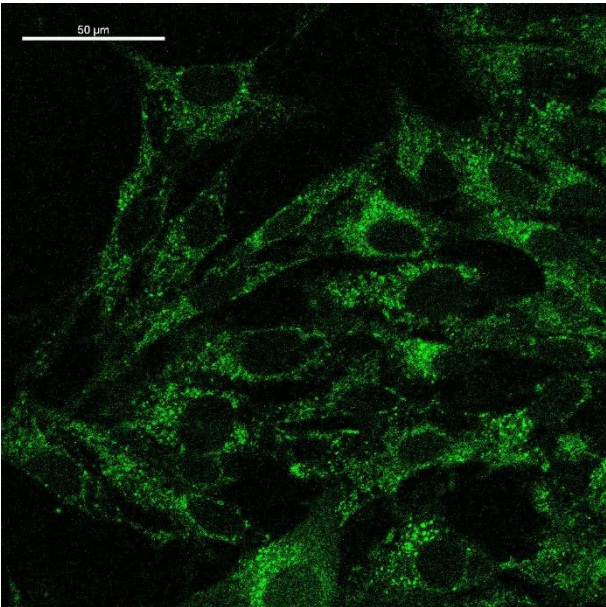
(b) H₂O₂ exposed-group



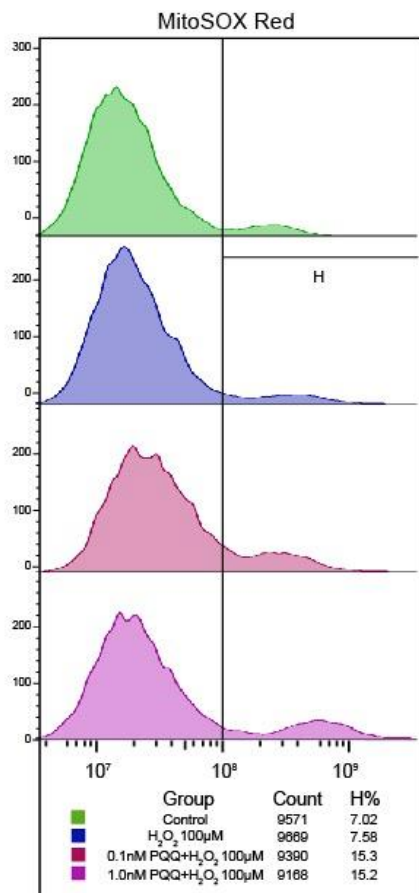
(c) PQQ 0.1nM treated H₂O₂ exposed-group



(d) PQQ 1.0nM treated H₂O₂ exposed-group

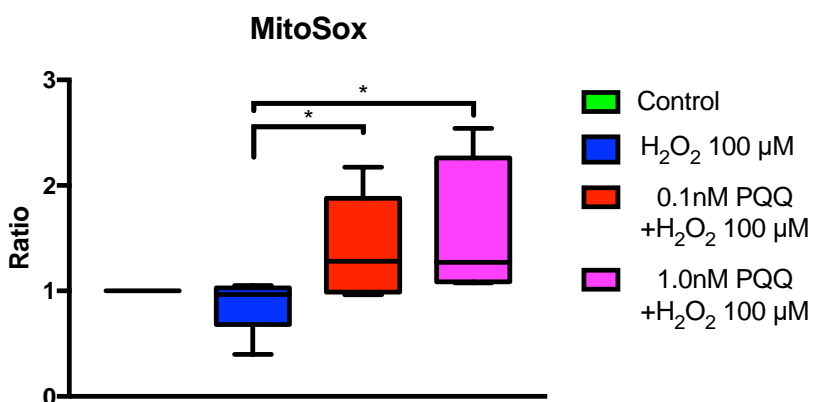


(a) The changes of MitoSOX Red intensity histogram in flow cytometry analysis.



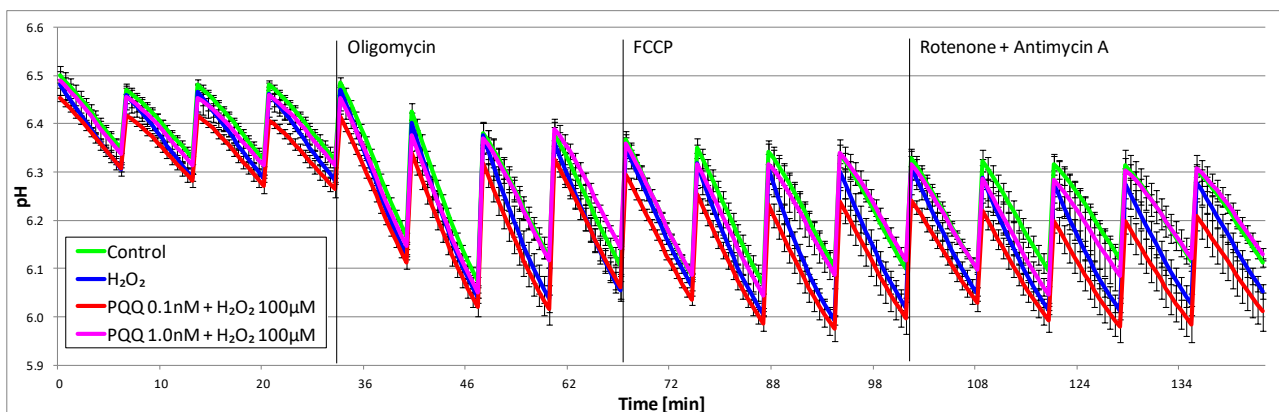
(b) The increased ratio in positivity rate over control of MitoSOX Red positive cells. (n = 5 per group; repeated experiments)

Box plot shows statistical parameters as follows; central line: median; box limits: first and third quartile; whiskers: minimum and maximum. * p<0.05.



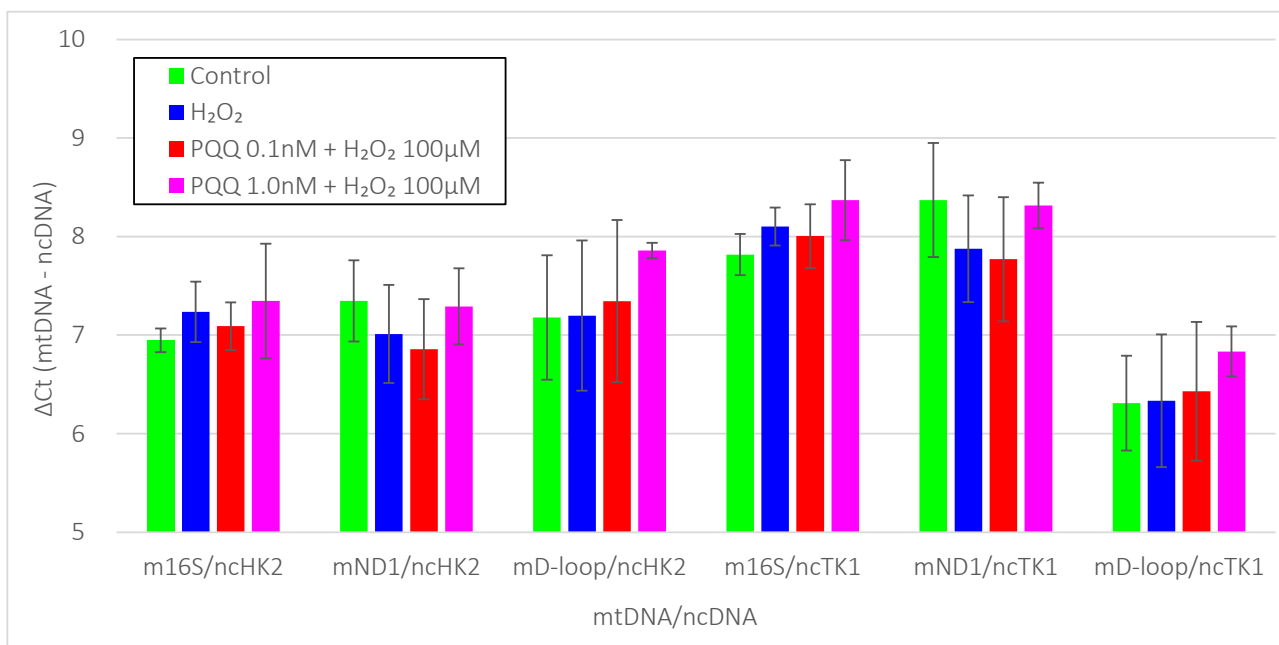
Supplementary Figure 4 The pH measurements of the XF24 analyzer

Data are shown as mean \pm standard deviation.

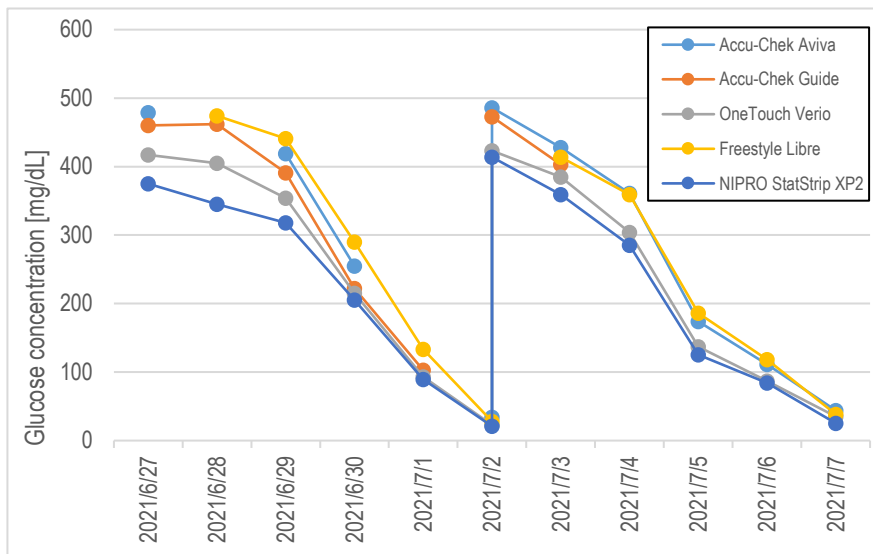


Supplementary Figure 5 The mitochondrial copy number analysis

Data are shown as mean \pm standard deviation.



Supplementary Figure 6 Change in glucose concentration of the medium in the control group over time
The glucose concentration of the medium decreased overtime from the days of passages (2021/6/27 and 2021/7/2).



Supplementary Data 1 XF Base Medium Formulation

MgSO ₄	0.8 mM
CaCl ₂	1.8 mM
NaCl	143 mM
KCl	5.4 mM
NaH ₂ PO ₄	0.91 mM
Phenol Red	3 mg/L

Other Constituents:

L-Arginine*HCl, L-Cystine*2HCl, Glycine, L-Histidine*HCl*H₂O, L-Isoleucine, L-Leucine, L-Lysine*HCl, L-Methionine, L-Phenylalanine, L-Serine, L-Threonine, L-Tryptophan, L-Valine, L-Tyrosine*2Na*2H₂O, Folic Acid, Riboflavin, D-Ca-Pantothenate, Choline Chloride, i-Inositol, Nicotinamide, Pyridoxine*HCl, Thiamine*HCl