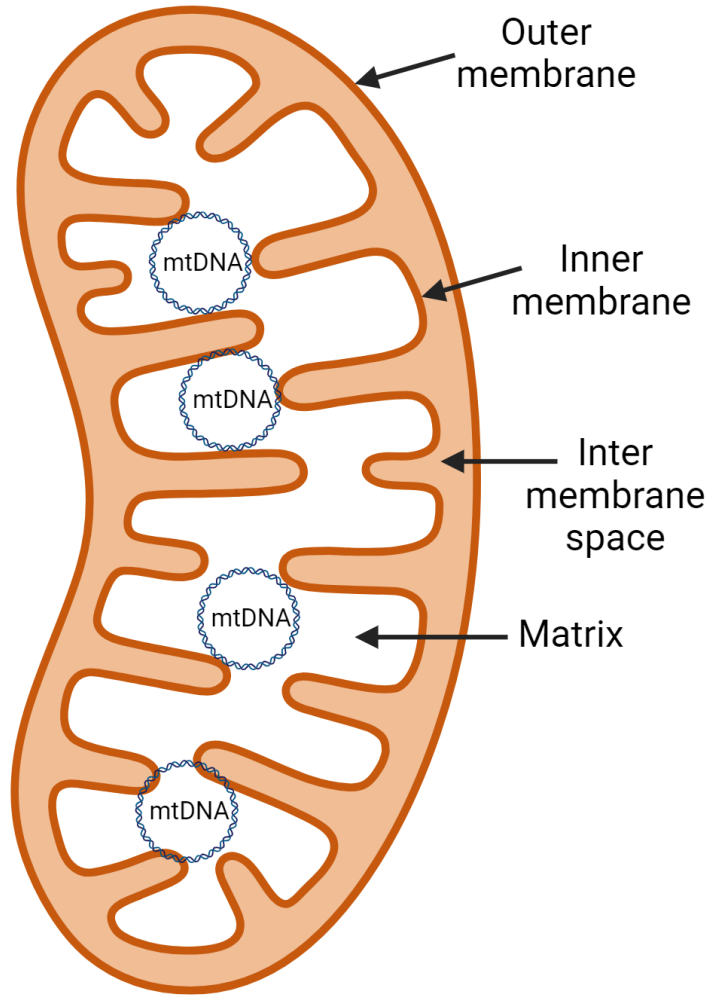
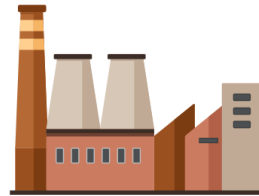


Mitochondria are multifunctional and essential



Signaling Roles

- Stress signaling
- Programme cell death
- Calcium signaling
- Stem cell differentiation

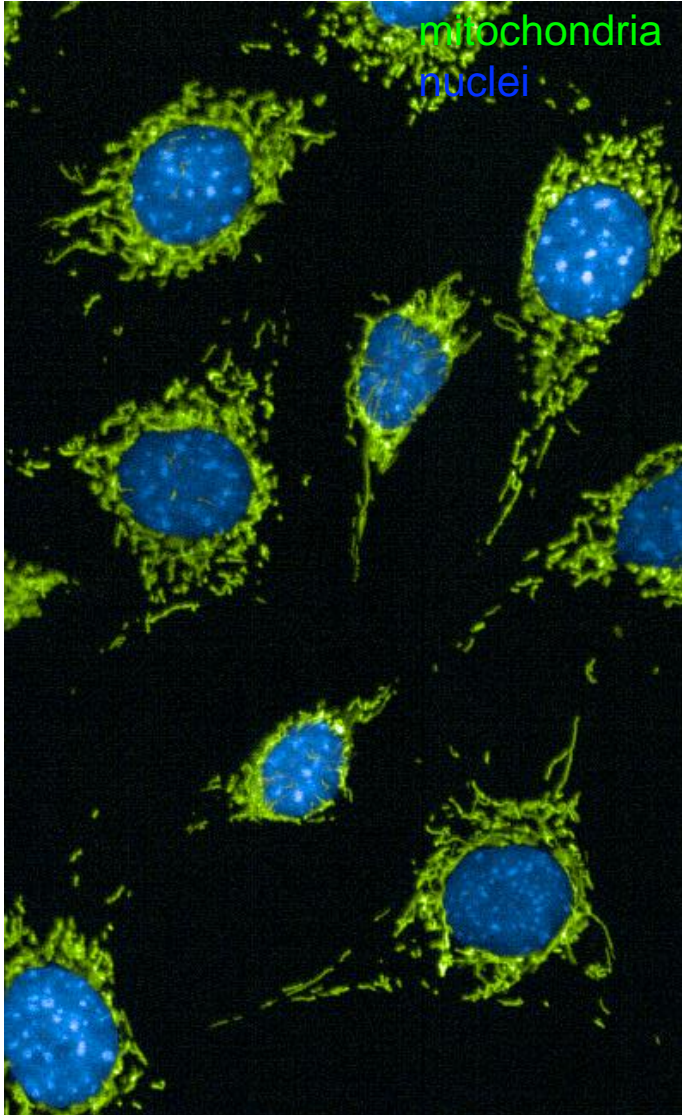


Biosynthetic Roles

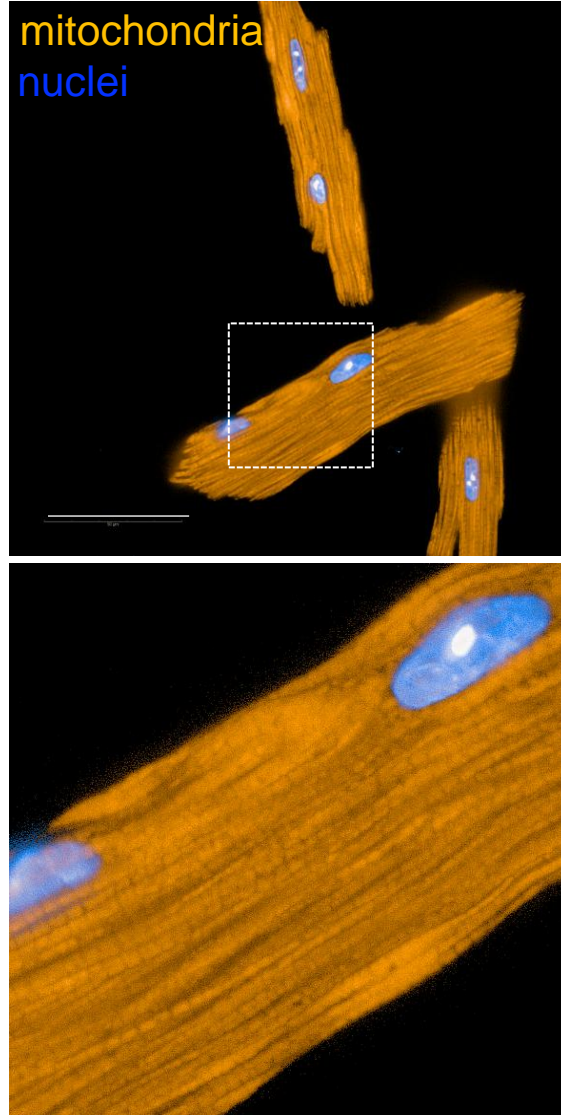
- ATP production
- Metabolism (Nucleotides, Lipids, Amino Acids)
- Iron(II) sulfide cluster biosynthesis

Different shapes in different tissues

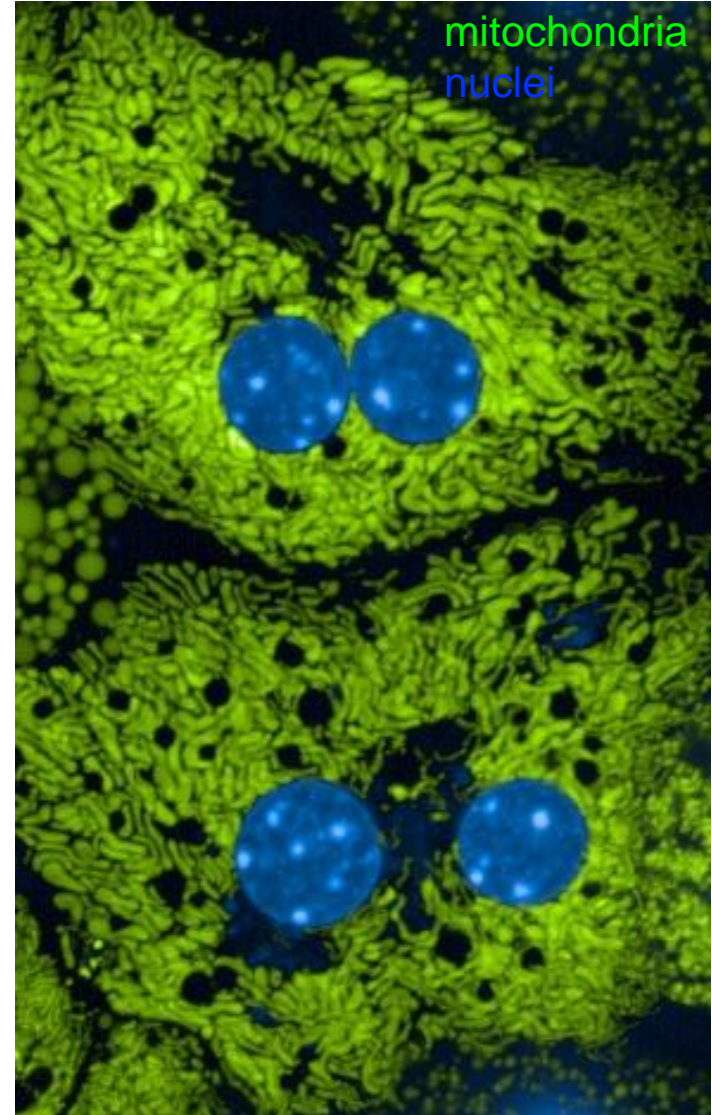
Mouse embryonic fibroblasts



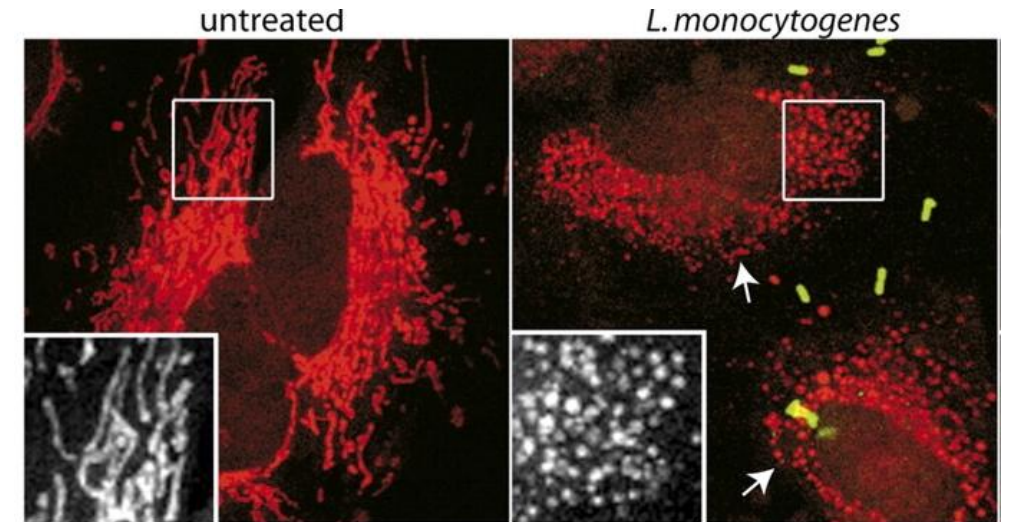
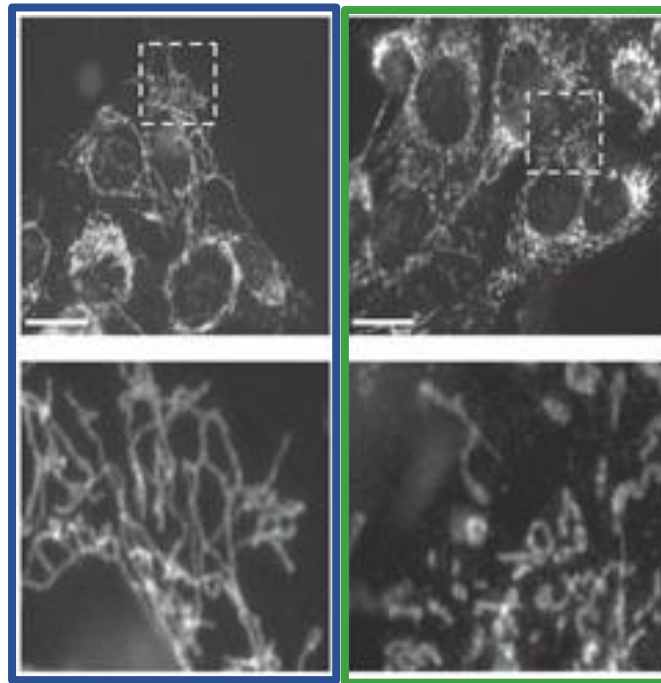
Primary adult mouse cardiomyocytes



Primary adult mouse hepatocytes



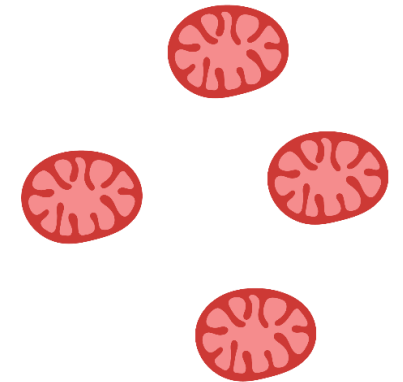
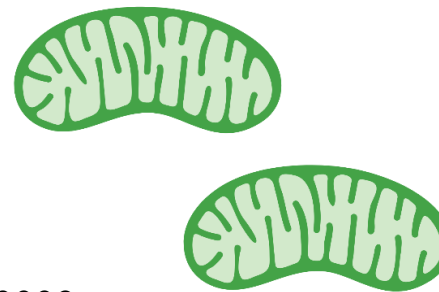
Mitochondria respond to external cues



Stavru et al. PNAS 2011



Tondera et al. EMBO J 2009



Starvation
Translation inhibition
Viral Infection

Cancer
Bacteria
OXPHOS poisons

Summary

- *Mitochondrial shape varies in healthy cells*
- *Mitochondrial structure and shape can be visualized in fixed and living cells*
- *Mitochondrial shape changes can be influenced by various physiological and pathological stimuli*
- *Pathogenic mutations in mitochondrial shaping proteins cause rare diseases*

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