Mitochondrial Membrane Potential Dynamics in a Whole-Heart Model of Sudden Cardiac Arrest

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**Background**

- Mitochondrial membrane potential ($\Delta \Psi_m$) loss during SCA leads to defibrillation failure and arrhythmias upon reperfusion
- $\Delta \Psi_m$ loss $\rightarrow$ [ATP]↓ $\rightarrow$ $K_{ATP}$ channel opens $\rightarrow$ action potential shortens, asystole occurs

**Goal**

- Investigate $\Delta \Psi_m$ depolarization and its relation to electrical activity
- New analysis method based on Spatial Fourier Transform of confocal fluorescent images of cationic dye TMRM

**Imaging Mitochondrial Potential in Whole-hearts**

30 min Ischemia

70 min Ischemia

**Initial Results:** $\Delta \Psi_m$ depolarization late and after asystole