

Specific Aim 1. To develop a robust method of ferritin overexpression in human iPS cells for *in vitro* (year 1 of the project) and *in vivo* detection by MRI (year 2).

Rationale and Overview of Experimental Design

Our principal hypotheses for this aim are: . . . OR

The purpose is

Experimental plan

Induction of ferritin overexpression in undifferentiated human induced pluripotent stem cells (iPS).

Confirmation of iron accumulation in transduced iPS overexpressing ferritin

Effect of ferritin overexpression on cell viability, proliferation and cardiac differentiation

Assessment of MRI capability to visualize iPS cells overexpressing ferritin.

Evaluation of MRI detection threshold *in vitro*.

MRI detection and quantification of graft size in the rat heart.

Specificity of ferritin detection by MRI.

Reproducibility of graft size measurements by MRI.

Assessment of left ventricle function by MRI *in vivo*.

Expected results, possible challenges and troubleshooting.