Authentication of Key Biological and/or Chemical Resources

Authentication of cell lines used in the proposal: Cell lines can experience cross contamination, misidentification, as well as genetic instability and phenotype drift over time. This is recognized by the investigators and to ensure authenticity of the cell reagents used in the proposal, the PIs will utilize the following approaches. For human iPSC lines, the karyotypes of the lines will be initially validated as normal, the lines will be uniquely identified by short tandem repeat (STR) testing, and pluripotency marker expression (Oct4, Nanog, SSEA4). All iPSCs will be expanded to generate master banks of validated cell lines that will be available for the projects. If iPSC lines are maintained in culture for more than 10 passages, their karyotype will be re-validated. For cell lines of clear value to the research community, we will partner with the WiCell Institute http://www.wicell.org/ to bank validated lines for distribution.

ENHANCING REPRODUCIBILITY THROUGH RIGOR AND TRANSPARENCY

Rigorous Experimental Design

The projects described in this application are designed to be scientifically rigorous through strict application of the scientific method to ensure robust and unbiased experimental design, methodology, statistical analysis, interpretation, and reporting of results. We will achieve robust and unbiased results by carefully designing the experiments and describing the experimental design and proposed methods at all levels throughout the studies, such as: use of standards, sample size estimation, randomization, double blinding, appropriate replicates, controlling for inter-operator variability, detailed statistical methods, inclusion and exclusion criteria, how missing data will be handled, and others as appropriate to the rigorous science. The fact that similar experiments and quality controls on the same materials (cells, tissues) will be independently performed at three institutions and in multiple laboratories will further ensure data reproducibility and scientific rigor.