November 16, 2015

Dear Regenerative Medicine Research Fund Advisory Committee:

The UConn-Wesleyan Stem Cell Core was established in 2006, and has been generously supported by the Connecticut Stem Cell Program since 2007. We have accomplished all the goals set out thus far in our previous proposals.

Throughout the past nine years, our core has continuously developed and provided expertise, services, and cutting edge technologies through institutional coordination with groups located on both the Farmington and Storrs campuses of the University of Connecticut. The core has generated iPSCs from more than 120 tissue samples from both affected and unaffected individuals. iPSCs are generated from human skin, blood and cord blood, using integration-free methods such as episomal and Sendai viral vectors. The core is proficient with feeder-dependent and feeder-independent culture and reprogramming technology. We are able to receive samples by courier worldwide. The core also continues to bank and distribute the most-widely used hESC and iPSC lines and make them available to the local research community.

We continue to offer training and technical support in methods to culture hESCs and hiPSCs and for their lineage-specific differentiation, and organize workshops on current state of the art technologies. The co-PI Dr. Laura Grabel of Wesleyan University will continue to guide our successful outreach program to college students throughout the state. The Storrs-based component of our core, directed by Drs. Rachel O’Neil and Judy Brown, performs quality control for hESC and iPSC genome integrity by the standard karyotyping and fluorescence in situ hybridization (FISH) assays, as well as by the CytoScan microarray technology based on single nucleotide polymorphisms (SNPs). They have also developed novel assays of stem cell pluripotency and differentiation using deep sequencing.

We are pleased to offer a full service for genome editing through the use of transcription activator-like effector nucleases (TALENs) and clustered regularly interspaced short palindromic repeats (CRISPRs.) We are now able to edit human genomes in stem cells derived from patients (or normal subjects) to model disease, correct disease-associated mutations or create reporters for drug screening. These services significantly enhance the power of stem cell research in Connecticut, in particular to better translate stem cell models of human disease to clinical therapeutics. We have also recently launched a Single Cell Genomics Center in collaboration with the Jackson Laboratory for Genomic Medicine. This center, directed by Dr. Paul Robson, houses state-of-the art microfluidics as well as mass and flow cytometry instrumentation for “omics” scale studies of stem cell pluripotency and heterogeneity.
The Core is pleased to offer this wide range of cutting-edge services to our stem cell research community and pledges to continuously incorporate and provide the newest of technologies to colleagues supported or to be supported by the Regenerative Medicine Research Fund Program.

Sincerely,