

**Regenerative Medicine Minnesota  
Progress Report  
Due: May 30, 2016**

**Grant Title:** Undergraduate Scholar in Regenerative Medicine

**Grant Number:** MRM 2015 USCH 002

**Requestor:** Joseph P. Voth

**Project Timeline:** May 1, 2015 – April 30, 2016

**Brief Description:** In the past year, I graduated with a degree in Neuroscience, and received a publication for my work in the lab of Drs. Walter Low and Ann Parr. I assisted on the project attempting to generate human dopamine neurons in pigs through a method known as blastocyst complementation. Additionally, I assisted Dr. Ann Parr in immunohistochemistry for her publication regarding immune cell infiltration in rat spinal cord injuries. I am currently characterizing the distribution of *Olig2*-positive oligodendrocyte precursor cells in developing porcine embryos to provide the foundation and baseline characterization for future blastocyst complementation studies.

**Outcome:** The RMM funds allowed me to spend an entire Summer and year in the laboratory, in which time I completed the immunohistochemistry to be included on the publication (see below). I found that there was no T-cell dependent macrophage infiltration in rat spinal cord injuries, as both macrophage types were similar in number regardless of whether the rat was athymic or thymic. Additionally, I helped image and quantify the dopamine neuron concentration in the substantia nigras of the porcine brains that were complemented with human stem cells to see if there were any differences among groups. We found a difference between *Pitx3* knockout embryos and WT, but the chimeras were variable in amount. Some chimeras had large amounts of TH, a marker for dopamine neurons, while others were closer to KO levels. Additionally, I found that no off-target incorporation was seen in any of the chimeras, which is crucial information since blastocyst complementation is a relatively new and poorly characterized method.

Through this grant, I was allowed to fully immerse myself in stem cell biology and neuroscience, and I am fully confident that I will remain in the field. I have received a full-time position in Drs. Parr and Low's laboratory to continue to study blastocyst complementation. After that, I intend to begin a Ph.D. program somewhere in stem cell biology/neuroscience. Ultimately, I want to complete my Ph.D. in a subject area that will make a large impact and be translational in nature.

**Publication:**

Satzer, D., Miller, C., Maxon, J., Voth, J., DiBartolomeo, C., Mahoney, R., ... Parr, A. M. (2015). T cell deficiency in spinal cord injury: altered locomotor recovery and whole-genome transcriptional analysis. *BMC Neuroscience*, 16, 74. <http://doi.org/10.1186/s12868-015-0212-0>.

**Responsible Spending:** All funds were used for my salary as I completed the work described above. There are no unspent funds.