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## Scalable, Defined Production of Oligodendrocyte Precursor Cells to Treat Neural Disease and Injury

### Grant Award Details

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Scalable, Defined Production of Oligodendrocyte Precursor Cells to Treat Neural Disease and Injury

**Grant Type:** Quest - Discovery Stage Research Projects

**Grant Number:** DISC2-08982

**Project Objective:** Develop optimized, defined, scalable 3D process for hESC-derived OPC

**Investigator:**

<b>Name:</b>	David Schaffer
<b>Institution:</b>	University of California, Berkeley
<b>Type:</b>	PI

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**Disease Focus:** Neurological Disorders, Spinal Cord Injury

**Human Stem Cell Use:** Embryonic Stem Cell, iPS Cell

**Award Value:** \$1,627,099

**Status:** Closed

### Progress Reports

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**Reporting Period:** Year 2/NCE period

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### Grant Application Details

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**Application Title:** Scalable, Defined Production of Oligodendrocyte Precursor Cells to Treat Neural Disease and Injury

**Public Abstract:****Research Objective**

The goal of this proposal is to develop an optimized, scalable process to manufacture high quality oligodendrocyte precursor cells (OPCs) from human pluripotent stem cells for treating human disease.

**Impact**

OPCs have therapeutic potential for spinal cord injury, restoration of cognitive function after cancer radiation therapy, inherited demyelinating disease, and potentially multiple sclerosis.

**Major Proposed Activities**

- To engineer human embryonic stem cell lines with fluorescent protein reporters to quantify differentiation into oligodendrocyte precursor cells (OPCs).
- To use a high throughput system to screen thousands of cell culture conditions and thereby optimize a chemically-defined three-dimensional culture for differentiation into OPCs.
- To validate the capacity of the differentiated oligodendrocyte precursor cells to remyelinate neurons in culture and in the nervous system.
- To scale up this cell manufacturing system in a bioreactor for future translation towards preclinical and clinical studies.

**Statement of Benefit to California:**

This proposal will accelerate the development of a stem cell therapy to treat patients with demyelinating conditions, a serious unmet medical need. Also, the PI has a strong record of translating research towards clinical development within industry, particularly within California. Finally, this project will expose young scientists within a large stem cell center to highly interdisciplinary training at the interface of science and engineering, thereby enhancing our California workforce.

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