

---

**Transplantation of Pluripotent Stem Cell Derived Microglia for the Treatment of Adult-onset Leukoencephalopathy (HDLS/ALSP)**

**Grant Award Details**

---

Transplantation of Pluripotent Stem Cell Derived Microglia for the Treatment of Adult-onset Leukoencephalopathy (HDLS/ALSP)

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

**Grant Number:** DISC2-12130

**Project Objective:** To develop an hPSC-derived microglial cell therapy candidate for adult-onset leukoencephalopathy (ALSP).

**Investigator:**

<b>Name:</b>	Mathew Blurton-Jones
<b>Institution:</b>	University of California, Irvine
<b>Type:</b>	PI

---

**Disease Focus:** Neurological Disorders

**Human Stem Cell Use:** Embryonic Stem Cell

**Award Value:** \$214,668

**Status:** Active

**Grant Application Details**

---

**Application Title:** Transplantation of Pluripotent Stem Cell Derived Microglia for the Treatment of Adult-onset Leukoencephalopathy (HDLS/ALSP)

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

We propose to investigate the transplantation of pluripotent stem cell derived microglia as a potential therapy for the devastating neurological disease; Adult-onset leukoencephalopathy (ALSP/HDLS).

**Impact**

The most immediately impacted condition will be ALSP. However, further examination of the safety of human microglial transplantation will have broad implications for many neurodegenerative disorders

**Major Proposed Activities**

- We will differentiate the human embryonic stem cells line ESI-017 into microglia, the primary immune cell of the brain.
- We will assess the purity of stem cell derived microglia by examining multiple markers for microglia and stem cells. We aim to achieve greater than 99% purity.
- We will utilize single cell RNA sequencing as a sensitive method to determine whether any contaminating pluripotent stem cells remain following microglial differentiation.
- Using specialized mice that develop ALSP pathology and allow human cells to be transplanted, we will engraft human microglia into the brain.
- We will allow mice to age for 3 months and then use a series of tests to examine the impact of microglial transplantation on motor and cognitive function.
- We will examine the impact of human microglial transplantation on ALSP-associated neuropathologies. We will then report our results and schedule a discussion with the FDA.

**Statement of Benefit to California:**

Adult-onset leukoencephalopathy (ALSP) is a neurological disease that effects patients during the prime of their lives. Although rare, ALSP represents the clearest example of a 'microgliopathy', a disorder that affects microglia, the immune cell of the brain. As microglial dysfunction is implicated in virtually all neurological disorders, the examination of stem cell-derived microglia to treat ALSP could provide important insight into many of the neurological diseases that affect Californians.

---

**Source URL:** <https://www.cirm.ca.gov/our-progress/awards/transplantation-pluripotent-stem-cell-derived-microglia-treatment-adult-onset>