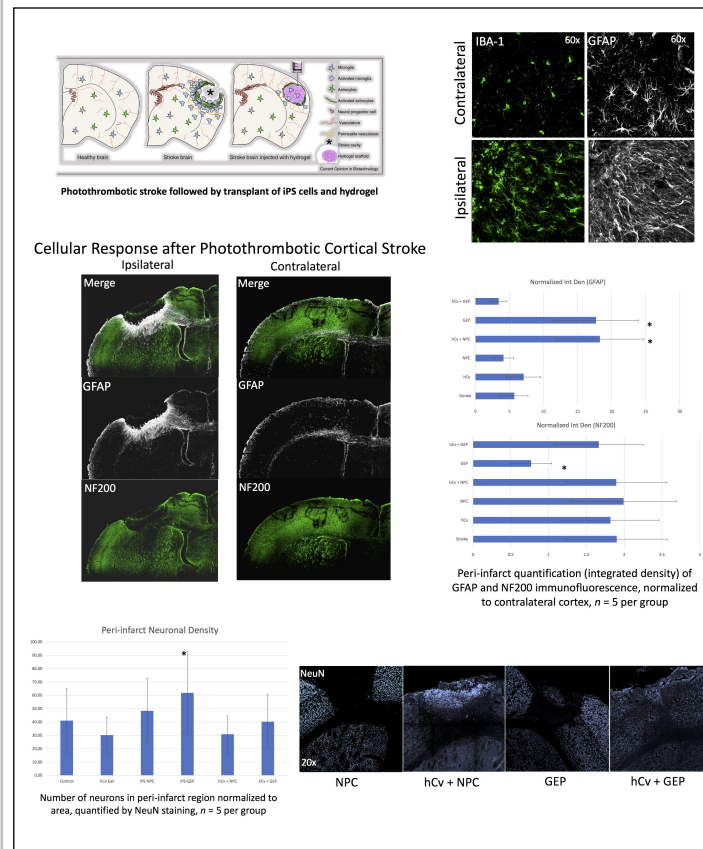
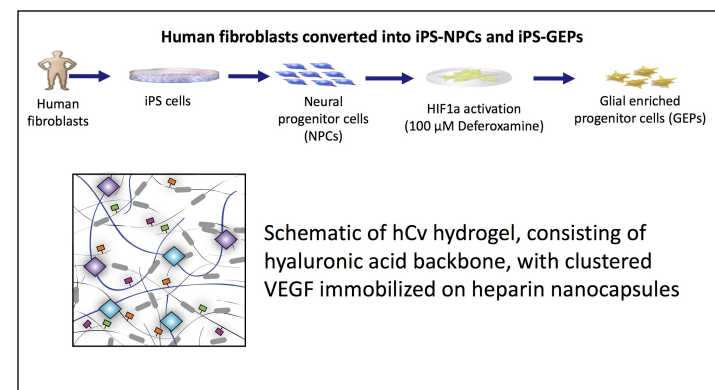


## Introduction

Stroke is a leading cause of adult disability, with a limited process of neural repair. Induced pluripotent glial progenitor cells (iPS-GEPs) have not been previously studied in cortical stroke but may be a promising therapeutic intervention due to their ability to differentiate into immature astrocytes. We have previously described a hydrogel suspension made up of a hyaluronic backbone with nanoparticles embedded with VEGF (hCv), engineered to serve as a tissue scaffold to promote progenitor cell survival and differentiation.

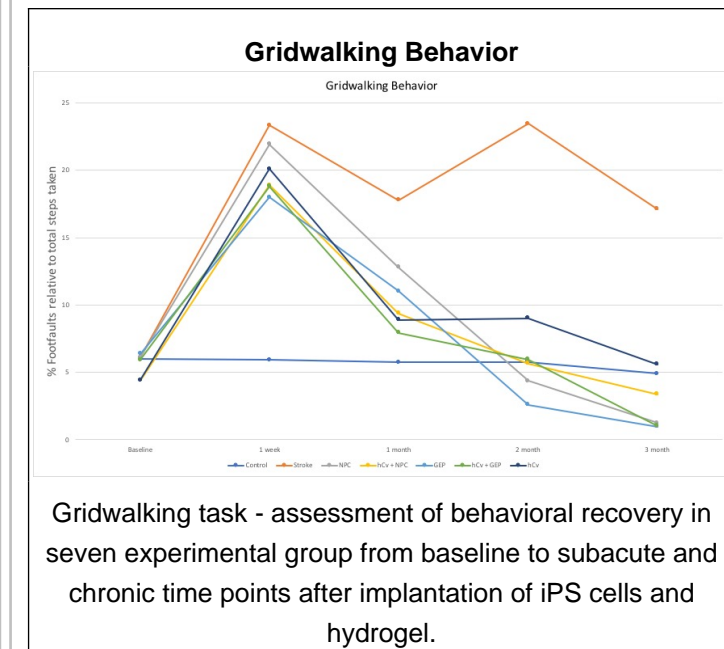
## Methods

We combined the novel use of human iPS-GEP cells with an injectable hydrogel (hCv) in a murine model of cortical stroke. We transplanted iPS-GEP cells embedded in a hydrogel to adult mice at a subacute time point (7 days) after a photothrombotic stroke. Additional groups included iPS-GEP cells without hydrogel, iPS-neural progenitor cells (iPS-NPC), and iPS-NPC with injectable hydrogel (hCv). Exploratory forelimb use and foot fault behavior tasks were used to assess motor recovery at baseline, 1 week (subacute), 1 month, 2 month, and 3 month (chronic) time points.



## Results

All mice displayed a significant motor deficit at 1 week with a gradual improvement to baseline levels over 3 months. While transplantation with hydrogel did result in a relative behavioral improvement at 1 month, at a 3 month time point there was no difference in between groups that had received hydrogel and those that had not. The transplantation of neural progenitor cells versus glial enriched progenitor cells had no differential effect on motor recovery after stroke. Cellular transplantation did provide a significant behavior improvement versus hydrogel alone.



## Conclusions

The results from this study are important in further characterizing the role of glial and neural progenitor cells in motor recovery after cortical stroke and highlighting the potential role for a structural hydrogel in this process.

## Future Directions

- Evaluate neural repair mechanisms after cellular transplant, including axonal sprouting and angiogenesis
- Analyze cell survival and differentiation, and migratory patterns of iPS-NPC and iPS-GEP cells
- Behavioral testing for forelimb motor recovery at subacute and chronic time points
- Perform Ca<sup>2+</sup>-imaging to assess changes in functional connectivity after combined therapy