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**Abstracts will be considered for both poster and platform presentations**

### ***Movement disorders***

Parkinson's disease (PD) is the second most common neurodegenerative disorder with an annual incidence of 50,000 and costs of \$ 25 billion in the US alone. There is no current cure for PD. Pre-clinical research shows that at earlier pathological stages, neurons retain some capabilities to recover if they are in an optimal neural repair media. Our research investigates a new therapeutic approach to provide such media using autologous peripheral nerve grafts as a source of the neural repair cells. Currently, two clinical trials (NCT01833364 and NCT02369003) are underway, which feature the implantation of autologous sural nerve grafts to the brain (targeted to the Substantia Nigra, Nucleus Basalis of Meynert, or Putamen) in combination with Deep Brain Stimulation (DBS) for the treatment of patients with severe Parkinson's disease. This nerve tissue is harvested from the sural nerve, a cutaneous sensory nerve located in the lateral ankle, of patients undergoing DBS surgery. The nerve receives a conditioning injury 14 days before grafting. As of August 2018, 60 patients have received DBS plus the graft. RNA sequencing of these nerve samples shows transcriptome changes consistent with the expected pro-regenerative changes of transdifferentiated repair phenotype Schwann cells. To study the neurobiology of the graft and how it may affect the host brain tissue, we grafted human sural nerve tissue into the brains of athymic nude rats, which we call "Neuro-Avatars". Each animal received a unilateral graft with a contralateral sham insertion. The brains of these animals were processed two weeks and six months later for histopathological analyses. The two-week timepoint data shows a substantial graft cell survival in addition to remarkable neuronal changes in the surrounding brain tissue. In conclusion, regenerative changes in the peripheral nerve tissue may hold the therapeutic potential to treat neurodegenerative diseases like Parkinson's disease.