Characterization of a model of Parkinson's Disease using synthetic α-synuclein inoculation to evaluate motor function, synucleinopathy, and dopaminergic neurotransmission.

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Alpha-synuclein is a presynaptic neuronal protein that is linked to Parkinson's Disease (PD) and contributes to disease pathogenesis. We sought to build on previous research on PD models by examining the pathogenic effects of synthetic α-synuclein proteins injected into the striatum in male C57Bl6/J WT mice at 8 weeks of age. Briefly, α-synuclein were inoculated via stereotaxic surgery into unilateral or bilateral mouse striatum. Animals were evaluated using a battery of behavioral tests to assess motor function as well as for markers of α-synuclein and dopaminergic neurotransmission.

Striatal inoculation with α-synuclein displayed strong Lewy-body-like pathology with hyperphosphorylated α-synuclein aggregates spreading from the striatum to nearby brain regions. We have also identified histopathological decreases in tyrosine hydroxylase, a key marker of dopaminergic neurons as well as a reduction in striatal DA and metabolite levels. Concluding remarks are pending additional behavioral data analysis. Our goal is to further characterize this model for testing disease modifying therapies for Parkinson's Disease.