

## Aims

While commonly believed to be a proteinopathy, recent studies have suggested a role for lipids in Parkinson's disease (PD) pathogenesis. Previously, cell type specific lipid storage changes have been shown in PD patient brains and lipid droplet binding may play a role in the oligomerization of alpha synuclein, the protein present in the disease's hallmark Lewy bodies. The aim of this study was to assess the role of fatty acid metabolism and storage across cell types.

## Methods

FABP expression was assessed in PD and control human tissue by immunohistochemistry and western blot to understand changes in fatty acid processing over the course of disease. Wild type SH-SY5Y, alpha synuclein over-expressing SH-SY5Y and H4 cell lines were treated with fatty acids and stained for lipid droplet and lipid droplet associated proteins to assess cell type specific differences in fatty acid processing and better understand mechanisms effecting this system across cell types.

## Results

Preliminary results show that fatty acid binding protein (FABP) expression is higher in PD human tissue than in age matched controls. SH-SY5Y and H4 cell lines show differing fatty acid metabolism and differing levels of resiliency to fatty acid treatment. Differences in fatty acid metabolism between WT and alpha synuclein over-expressing SH-SY5Y cells lines also suggest a fundamental role for alpha synuclein in fatty acid metabolism.

## Conclusions

Investigating changes in lipid storage may provide powerful insights into disease progression and possible disease modifying treatments. By observing differences in FABP expression in PD human tissue relative to controls we can understand the role of lipid dysregulation in PD. Furthermore, investigating fatty acid metabolism across cell types may provide further insights into cell type specific changes in lipid metabolism and storage in PD.