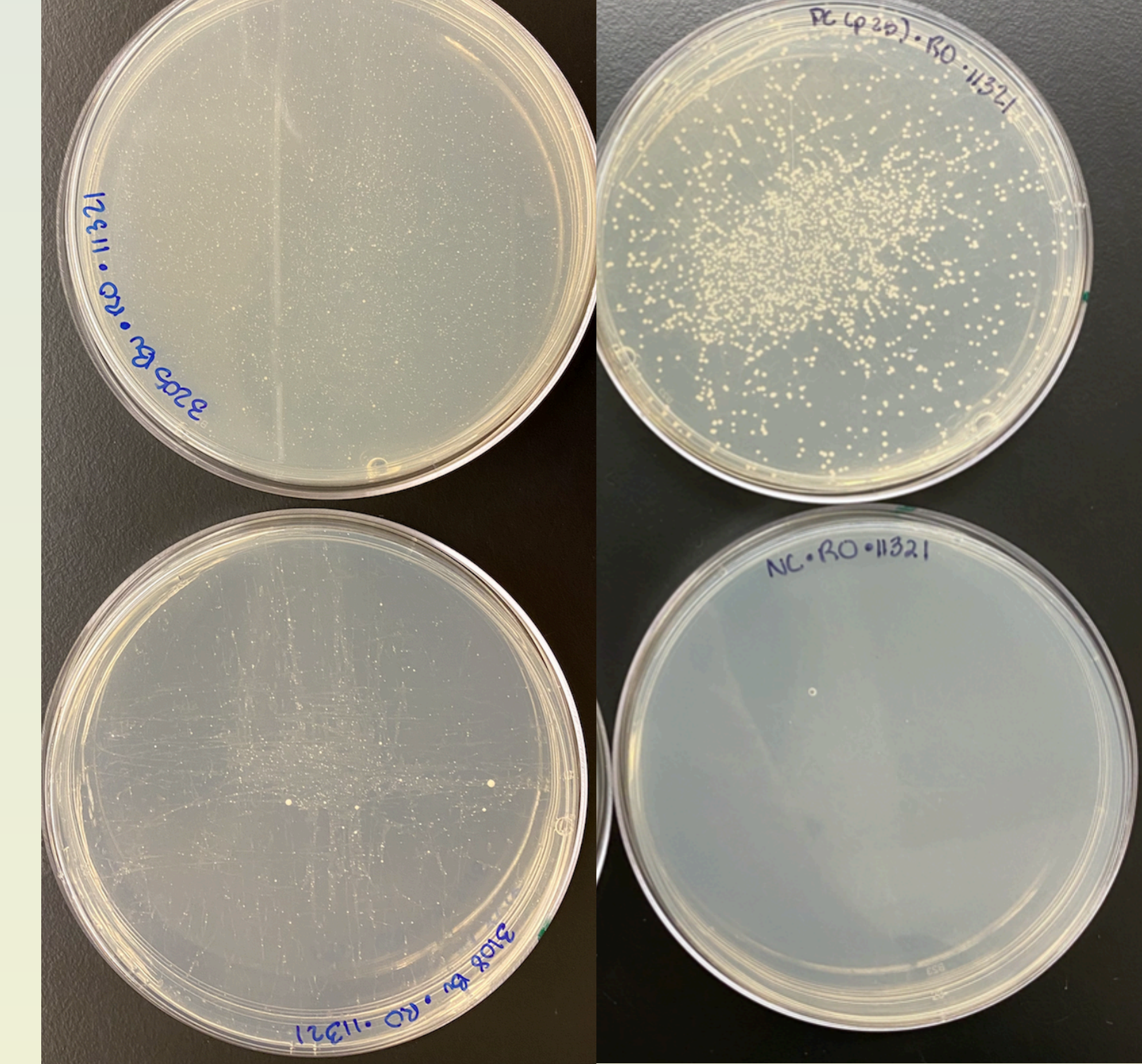# Spatial Sequestration of Alpha-Synuclein

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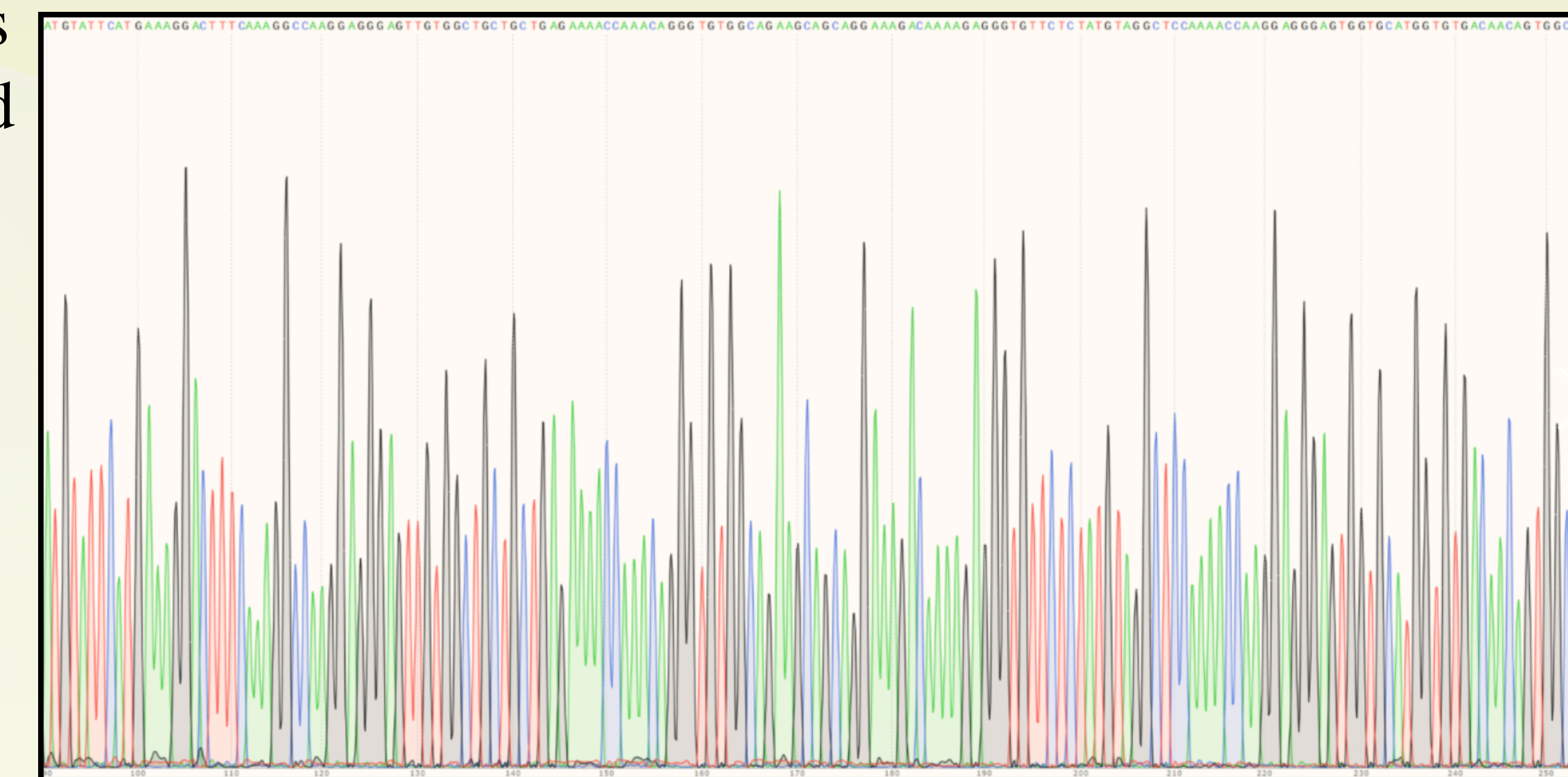
Project's Goal

Understand how mis-folded proteins associated with Parkinson's disease are sequestered by the cell and how this process affects toxicity of the mis-folded proteins.

Misfolded alpha-synuclein proteins

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https://www.rndsystems.com/resources/articles/alpha-synuclein-based-model-studying-parkinsons-disease-pathology

Background

Parkinson's disease is one of the most common neurodegenerative diseases. This disease is caused by the sequestration of accumulated mis-folded proteins in the brain. Alpha-synuclein toxicity results in the impairment of a cell's organelles further leading to cell death.

Parkinson's Prevalence by State*

Wisconsin
People with PD: 15000

People with PD
< 3.8K
3.8K - 8.0K
8.0K - 12.8K
12.8K - 20.9K
> 20.9K

*Click/Tap any state for more information.

What is it?
Parkinson's Foundation study to determine Parkinson's disease (PD) prevalence in North America.

930,000 people in the U.S. with PD by 2020

1.2 million people in the U.S. with PD by 2030

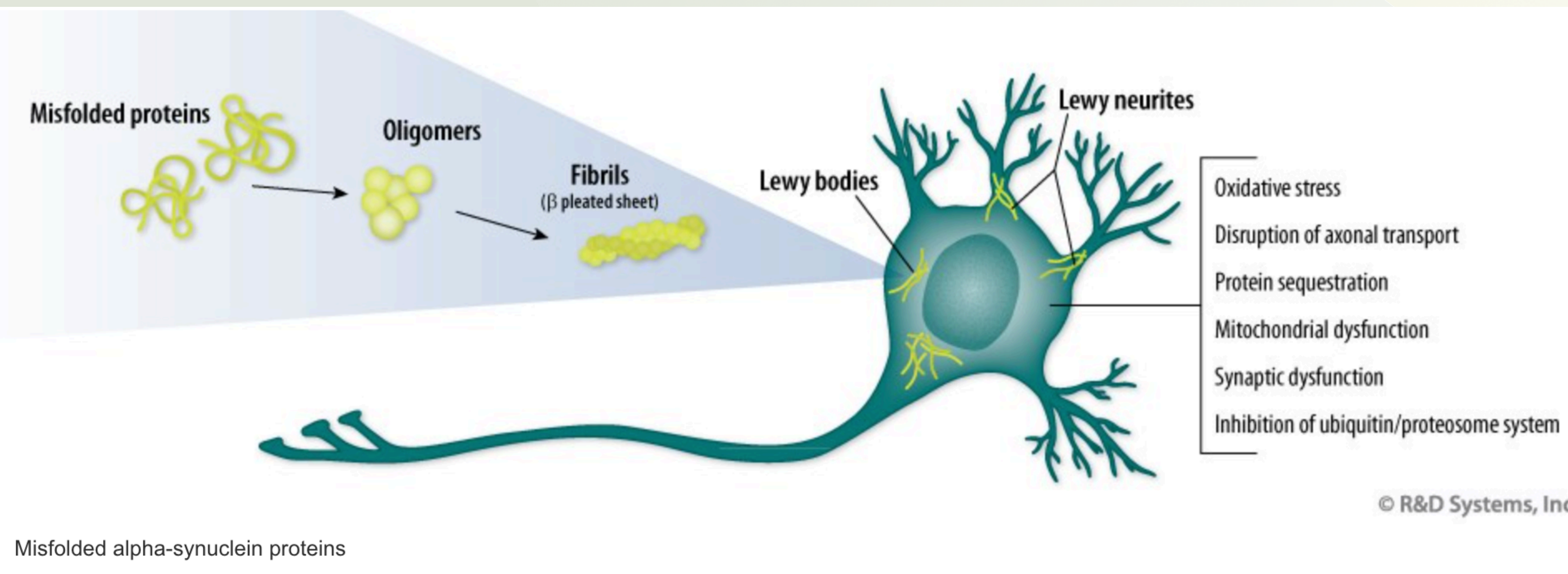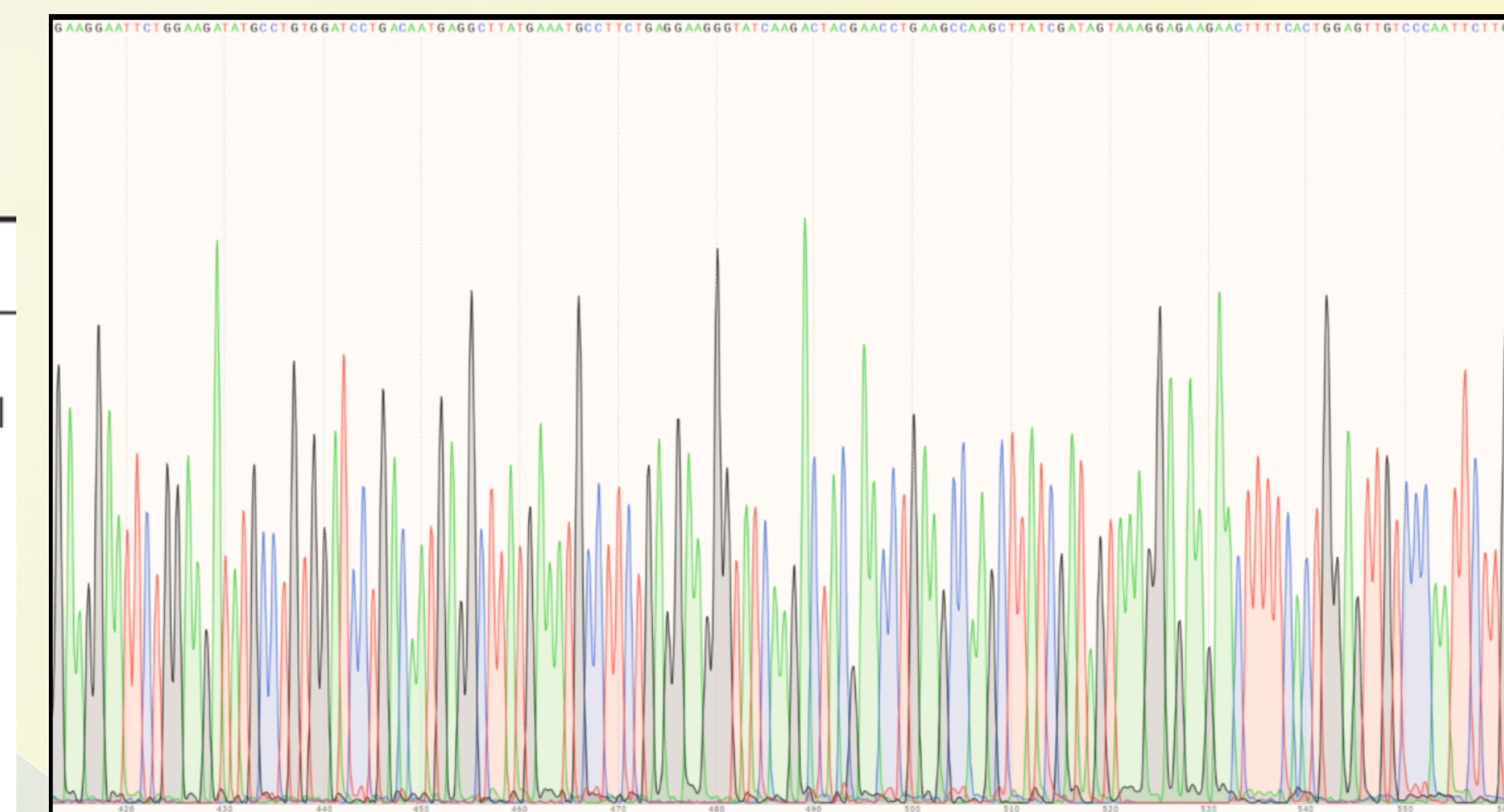https://www.parkinson.org/Understanding-Parkinsons/Statistics

Procedure

Made mini preps of the two plasmids of alpha-synulcein, one wild type and one with the A53T mutation. Then, transformed the yeast so the alpha-synuclein is present.

Sent alpha-synuclein plasmids for sequencing since there was no present growth on the LEU plates.

	PD
Neuropathological profile	
Synucleinopathy/Lewy bodies	α-syn inclusions in cell bodies and axonal processes of neurons and glia
Tauopathy/NFT	Rare
Behavioural symptoms	
REM sleep behaviour disorder	✓
Depression	✓
Hallucinations	Low rate
Delusions	✓
Memory loss	Rare
Motor symptoms	
Bradykinesia	✓
Tremor	✓
Postural instability	✓
Rigidity	✓
Clinical profile	
Attention/executive function	✓
Visuospatial dysfunction	✓
Language impairment	✓
Memory impairment	✓

Table 1. https://onlinelibrary.wiley.com/doi/epdf/10.1111/bpa.12370
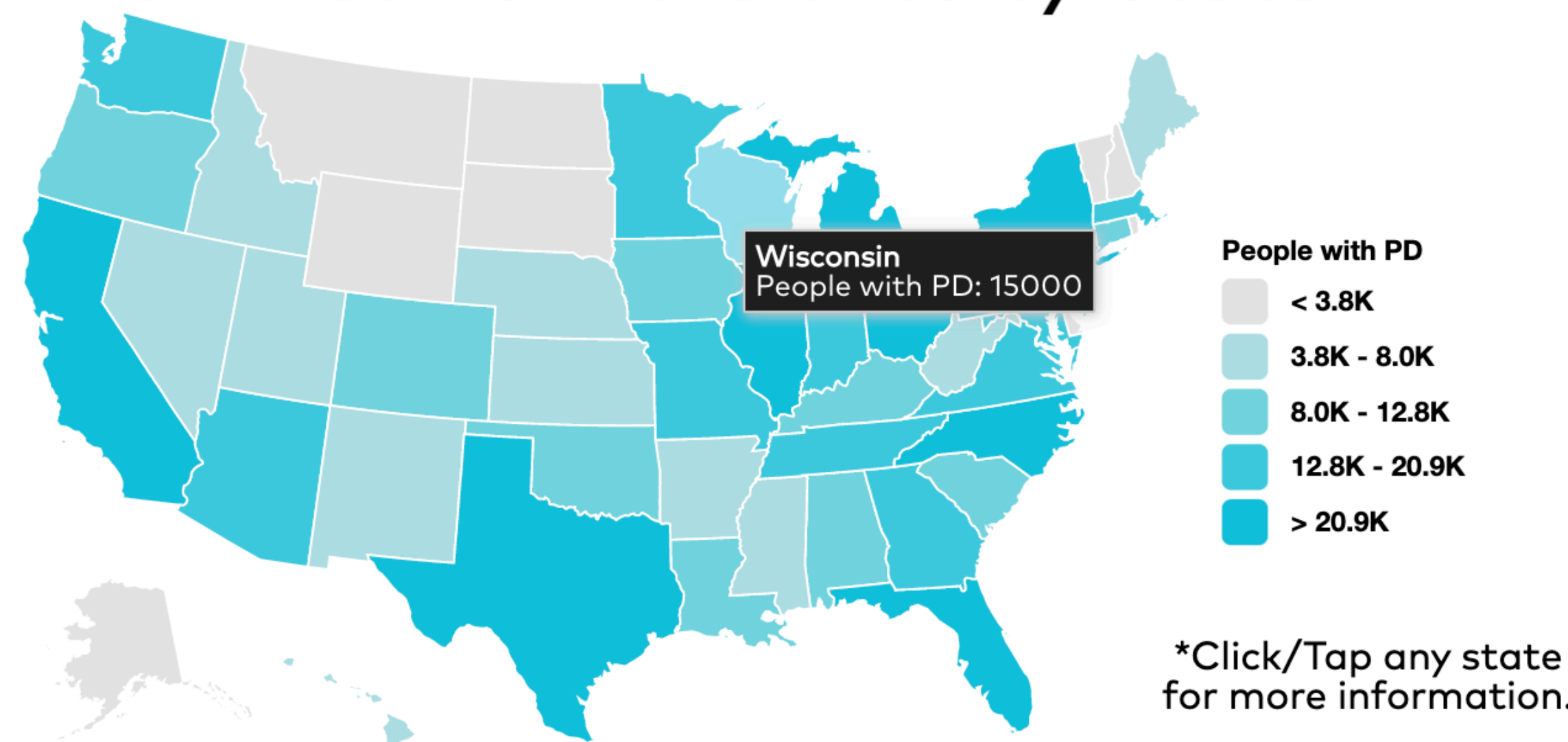
Results

Sequencing Histogram

Next Steps

• Fluorescence Microscope: observe which subcellular component alpha-synuclein is present in

• Western Blots: check expression levels

References

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https://www.rndsystems.com/resources/articles/alpha-synuclein-based-model-studying-parkinsons-disease-pathology
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