

Mitochondrial Abnormalities In Dementia with Lewy Bodies

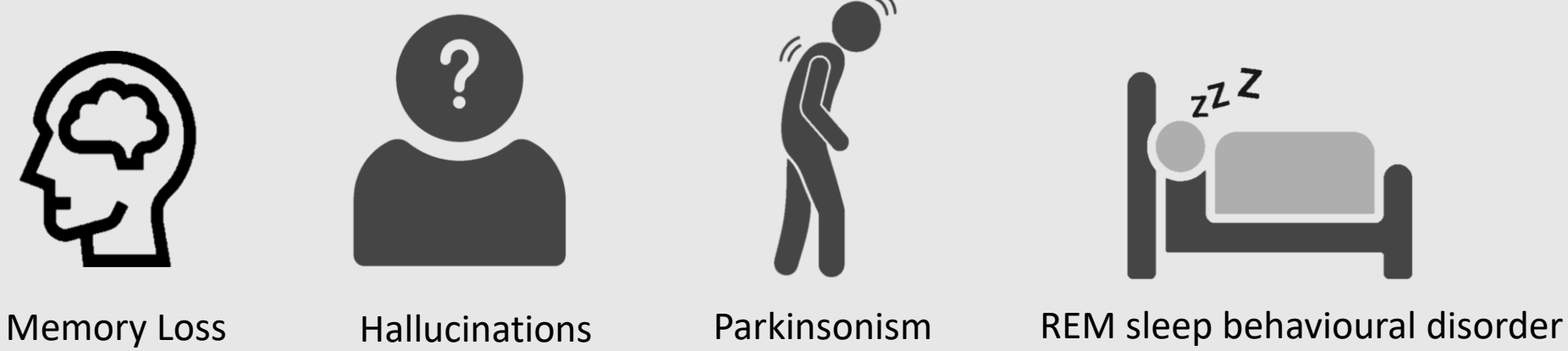
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What is Dementia with Lewy Bodies?

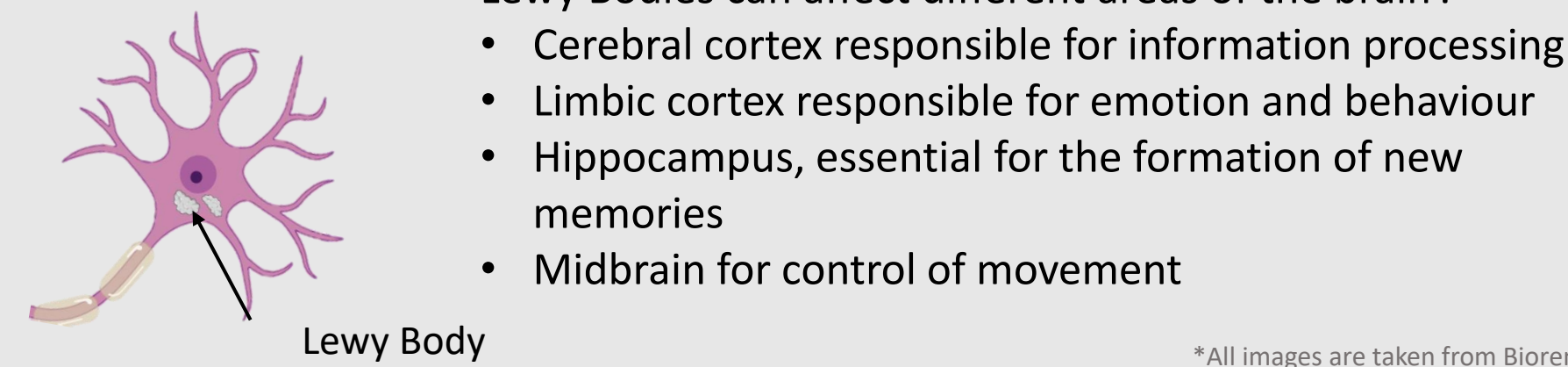
Dementia with Lewy bodies (DLB) is a common form of memory loss in elders⁽¹⁾.

DLB is characterised pathologically by the accumulation of α -synuclein protein⁽²⁾ that aggregates to form abnormal deposits called Lewy Bodies⁽³⁾ in cortical brain regions, resulting in the clinical symptoms of DLB.

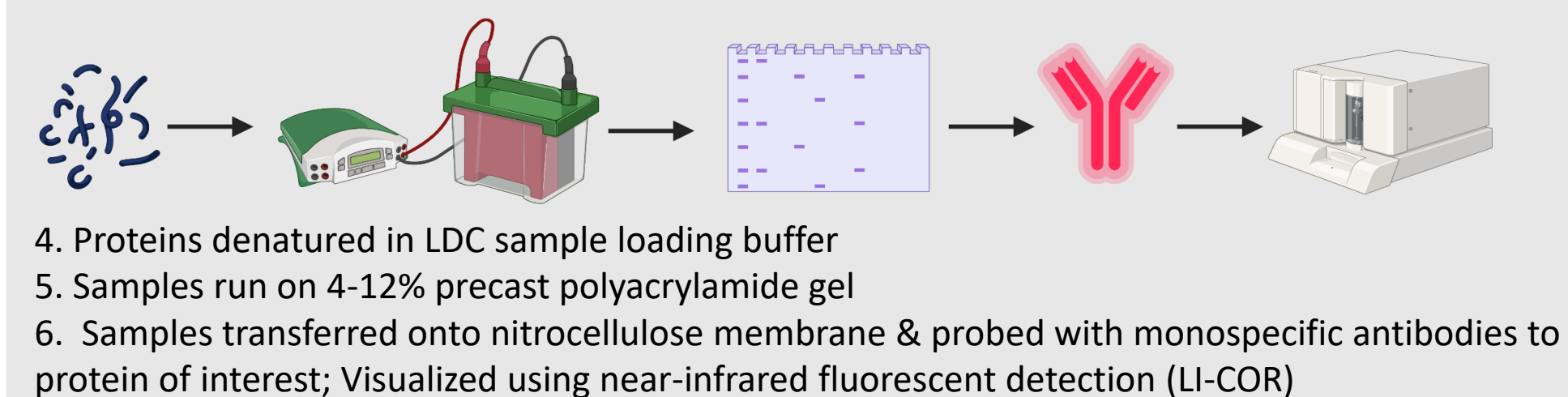
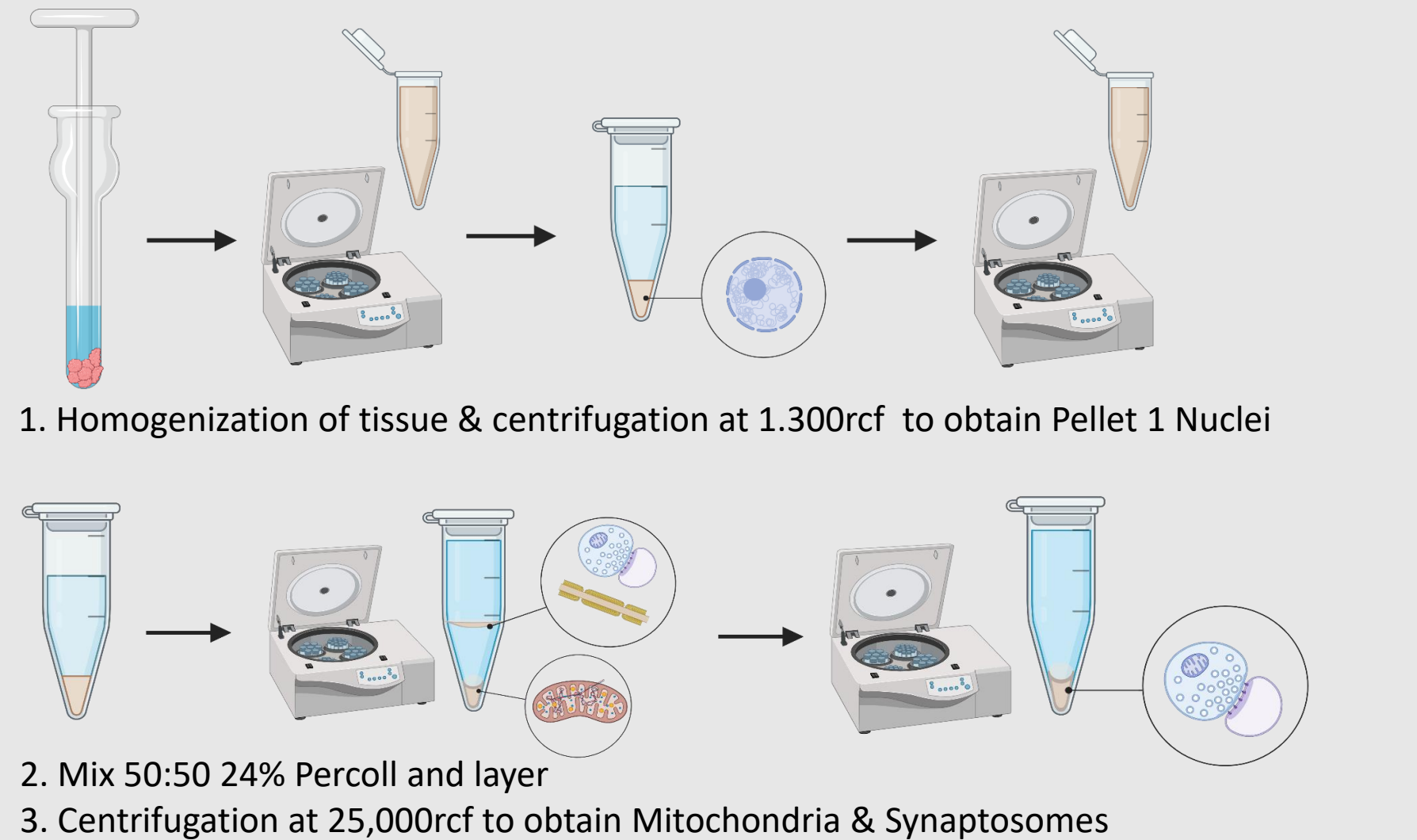
Symptoms:



Affected Neuron:



Methods



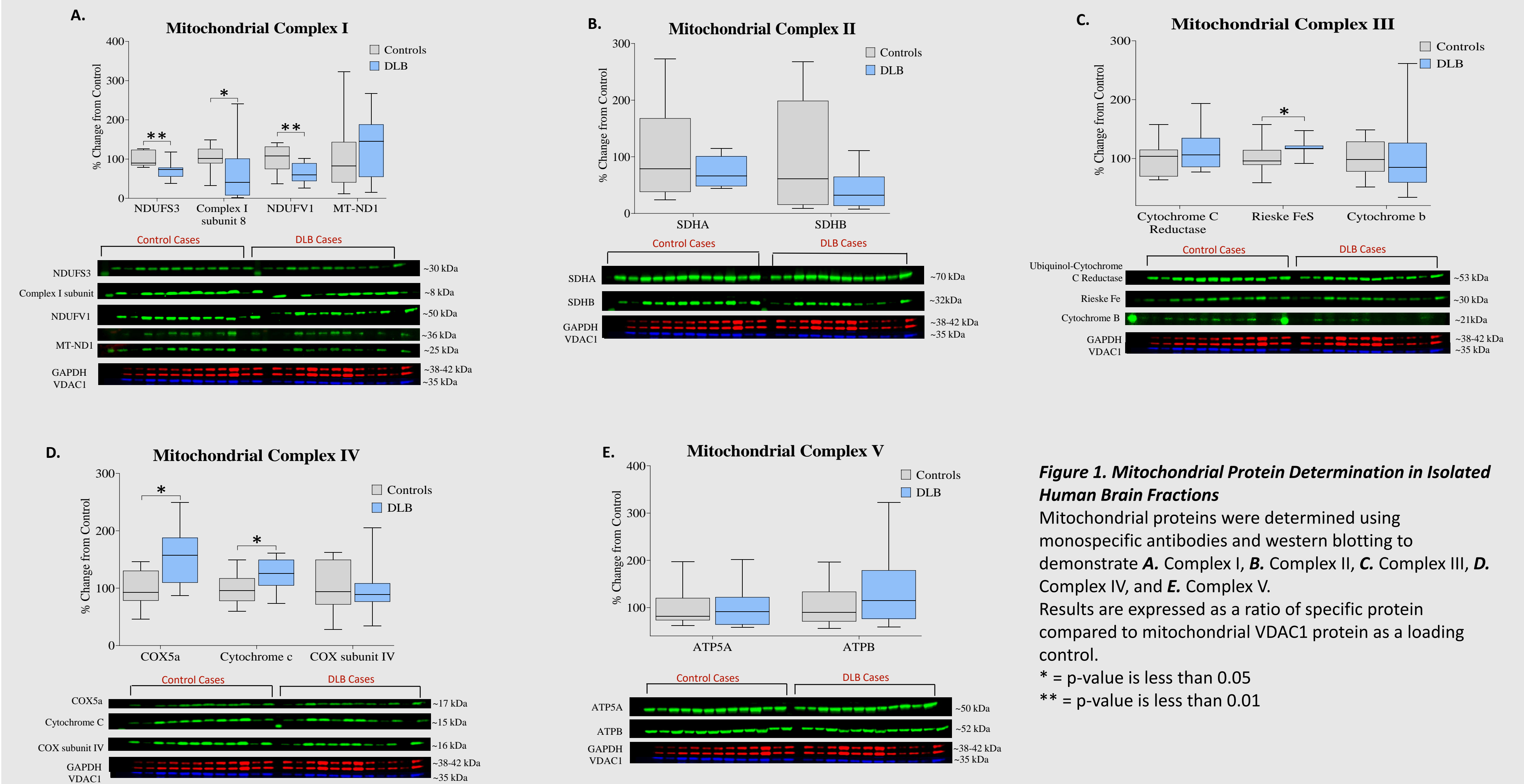
Aims

The aim of this project was to test if the symptoms of DLB are due to a build-up of α -synuclein in neuronal synapses, which cause damage to neuronal cells.

Hypothesis

Metabolic abnormalities are frequently seen using neuroimaging methods in key brain areas in DLB patients. We hypothesize this is due to mitochondrial changes controlling cellular respiration.

Results



Conclusion

We have developed a simple method for the isolation of highly enriched mitochondria from post-mortem human brain. This has enabled us to show:

- Relatively selective decrease in the expression of Complex I subunits in DLB, similar changes to that observed in Parkinson's Disease.
- No change in nuclear encoded Complex II subunits, indicating possible mitochondrial DNA damage to Complex I subunits.
- Increase in specific Complex III and Complex IV subunits. May be a compensation for decreased Complex I activity.

Mitochondrial activity are significantly altered in DLB and may explain some of the altered brain metabolism seen using neuroimaging in patients. Further investigation of mitochondrial activity in DLB is therefore warranted, along with determination of mitochondrial DNA damage.

References

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2. Outeiro TF, Koss DJ, Erskine D, Walker L, Kurzawa-Akanbi M, Burn D, Donaghy P, Morris C, Taylor JP, Thomas A, *et al.* Dementia with Lewy bodies: an update and outlook. *Mol Neurodegener.* 2019;14:5.
3. Ageing N-Nio. What Is Lewy Body Dementia? Causes, Symptoms, and Treatments. 2021 [cited 2023 13 July].

Acknowledgments

Thank you to Dr Chris M Morris and Dr Lina Patterson for giving me the opportunity to work with them and their team.