# DEVELOPING A BLOOD-BASED BIOMARKER TARGETING α-SYNUCLEIN FRAGMENTS FOR THE EARLY DIAGNOSIS OF PD

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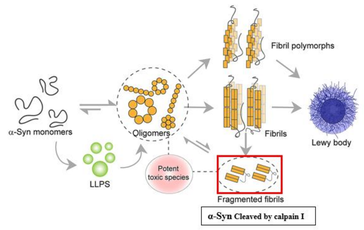
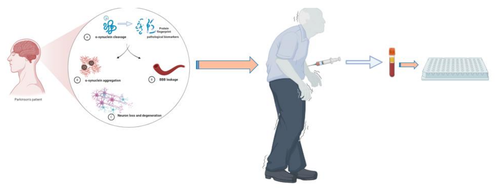
## BACKGROUND

- PD affects millions worldwide
- No cure, only symptom management
- Biomarkers and advanced diagnostic tools are needed
- Early stages: α-synuclein can be cleaved by Calpain I



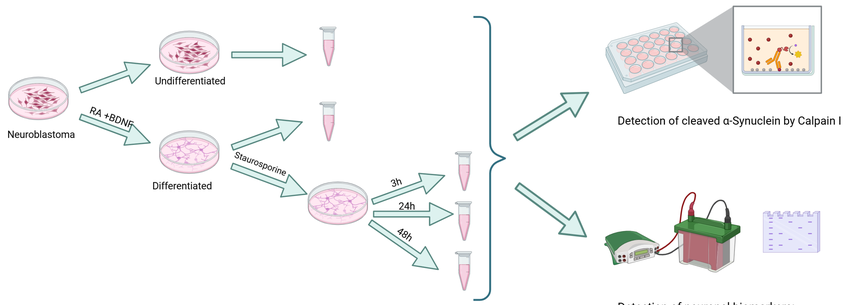

## Hypothesis & Aim

- Developing a sensitive immunoassay that detects α-synuclein fragments



## METHODS

- The antibody was generated to specifically target α-synuclein fragments cleaved by calpain I.
- A competitive ELISA was developed to analyze serum samples from clinical PD cohorts
- SH-SY5Y neuroblastoma cell model was used to bridge brain pathology to peripheral biomarkers and further validate the immunoassay.

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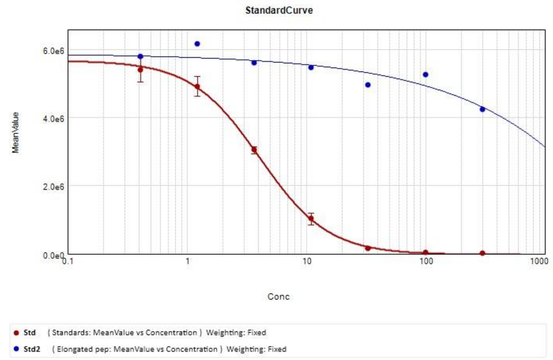
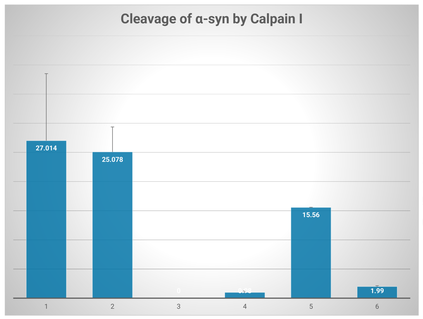
## RESULTS

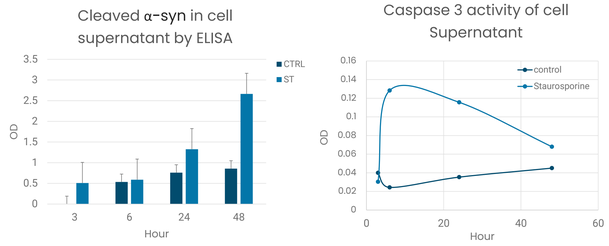
### Specificity of the developed antibody for α-synuclein fragments



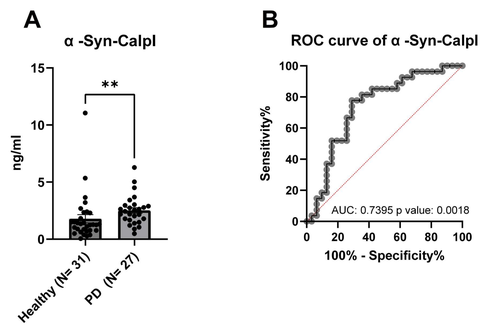




1. calp I + α syn 15min
2. calp I + α syn 45 min
3. cleavage buffer
4. calp I + buffer
5. α syn+ buffer
6. Elongated peptide

### α-synuclein fragments in apoptotic SH-SY5Y cells supernatant




### A developed competitive ELISA detecting α-synuclein fragments in PD




* p<0.05 ; ** p<0.01; *** p<0.001; **** p<0.0001

## CONCLUSION

- α-Synuclein fragments cleaved by calpain I represent key early drivers of PD pathology.
- This blood-based biomarker holds promise for early diagnosis and identification of treatment responders

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