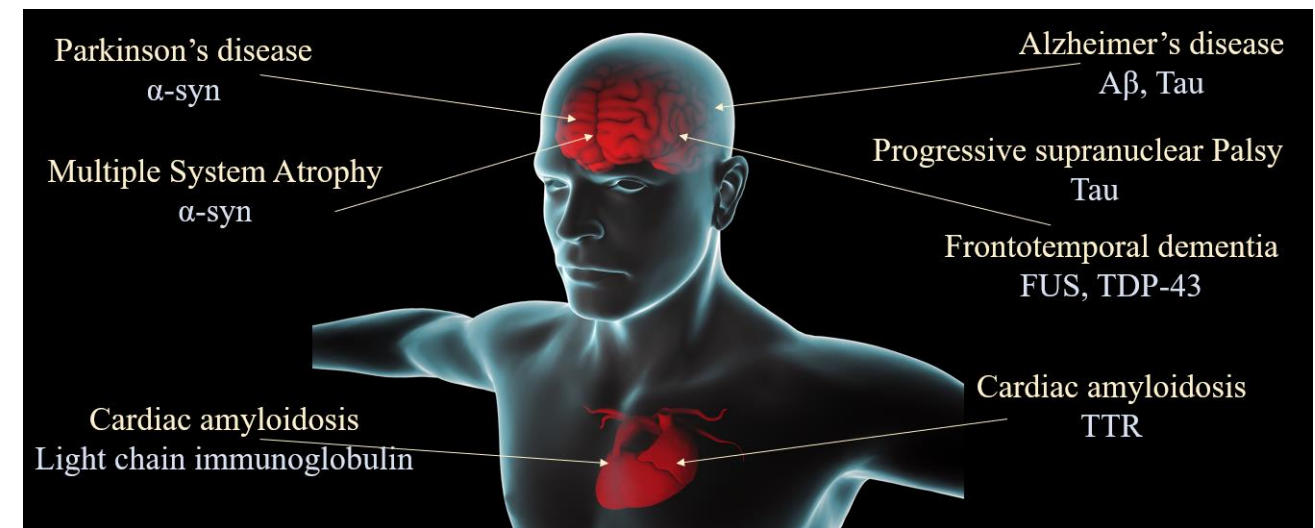
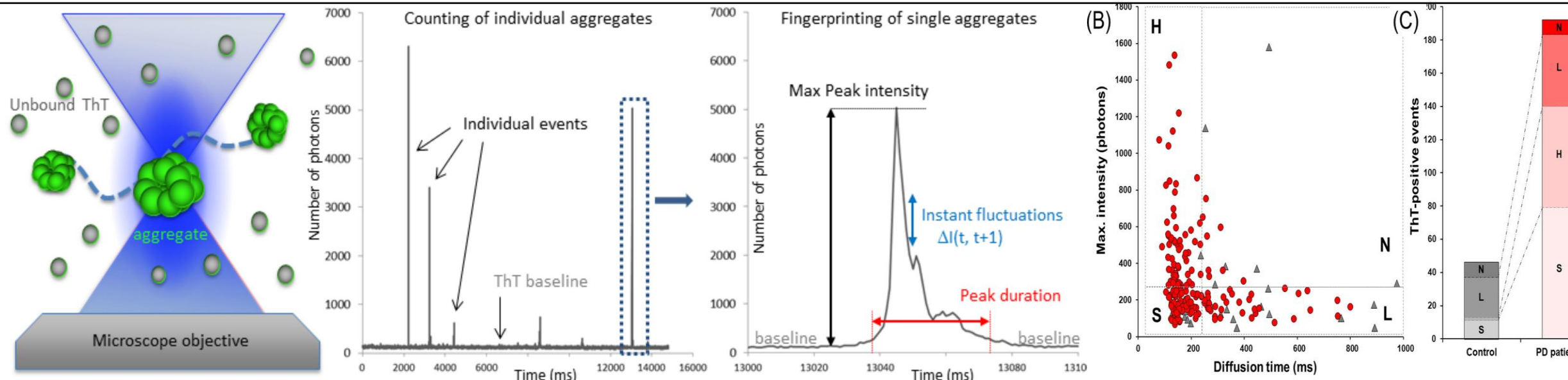


SINGLE MOLECULE DETECTION OF PROTEIN AGGREGATES

Our group is interested in the molecular mechanisms of protein aggregation found in many different diseases. We use single molecule to detect proteins and protein aggregates, and gain insights into the molecular chain of events that convert native protein into large, insoluble fibrils.

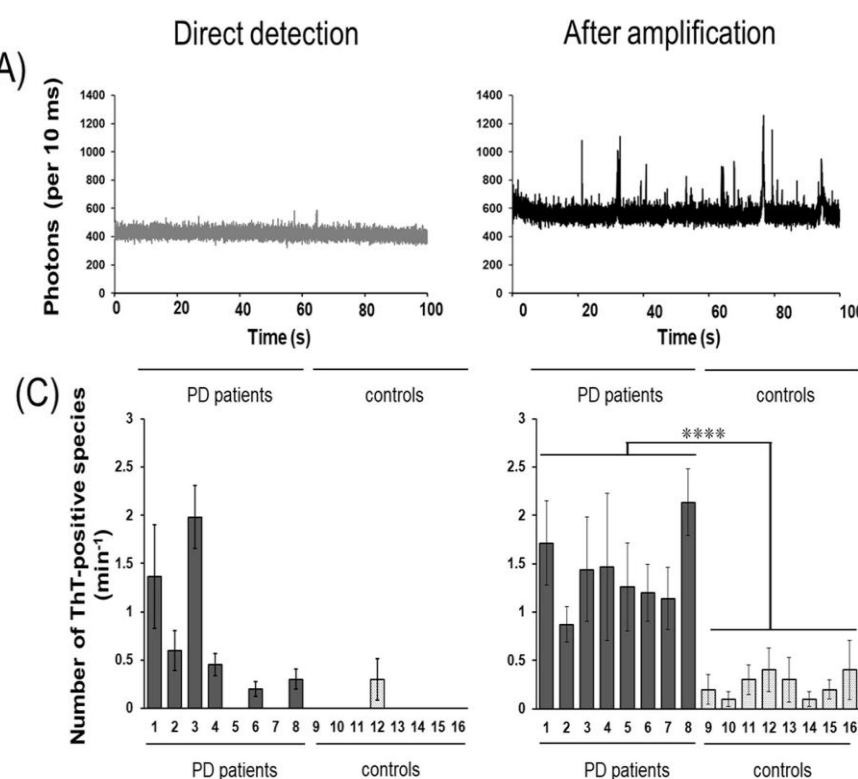
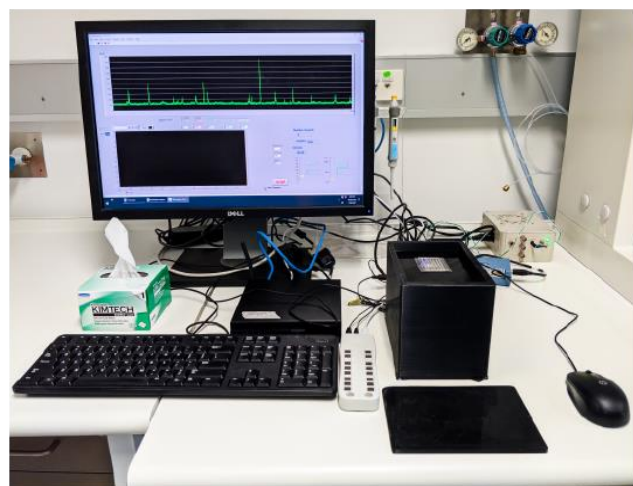


In this technique freely diffusing fluorescent molecules are detected when they diffuse into the confocal volume. Each event is detected as a burst of fluorescence in the time trace, making counting simple. Each peak encodes information on the aggregate. By plotting these information, we can fingerprint samples.

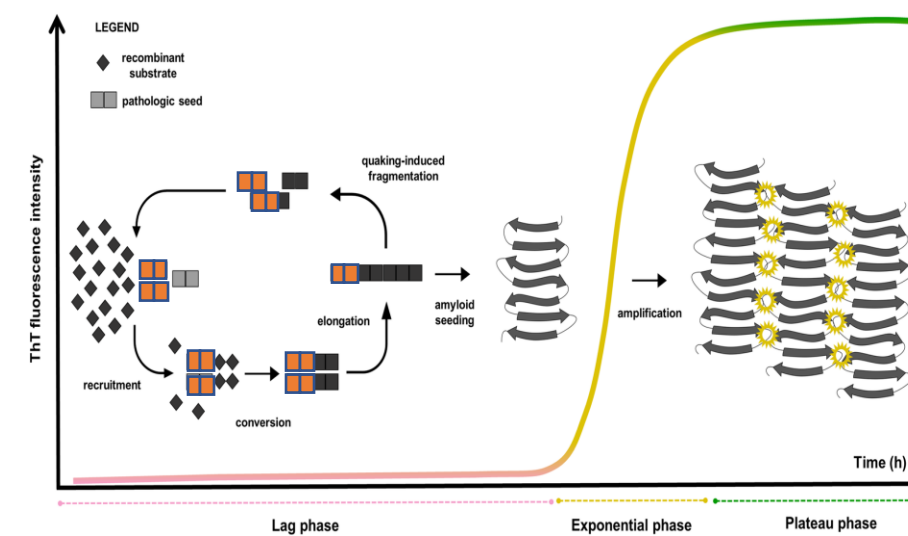


By combining single molecule detection and amplification assays, we develop new diagnostic methods for amyloid diseases

Measures are performed in a simple way on our 3D printed (A) instrument dedicated to detection of single protein aggregates



The technique has been applied to the detection of Synuclein aggregates in the cerebrospinal fluid of patients with Parkinson's disease.



Protein fibrils propagate like prions and "prion replication" assays have been used for diagnostics.

The equivalent of PCR for proteins, these assays amplify pathogenic seeds for very sensitive detection.

Want to participate? We are looking for students to develop a diagnostic assay for MSA and TTR...

Our group is at Lowy level 3 in Single Molecule Science

Contact: e.sierecki@unsw.edu.au