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Reagents that Distinguish AD and PD Samples

Diverse pathologies, especially related to early protein misfolding and aggregation, are observed in different neurodegenerative diseases. Some protein variants result in different proteinopathies that vary from patient to patient, highlighting a need for personalized diagnostic tests to enable accurate diagnoses. Reagents that can distinguish one neurodegenerative disease from another are particularly crucial.

Design ankyrin repeat proteins (DARPins) are small and highly stable structures that are ideal for protein-protein interactions. Their stability is maintained even following connection of multiple repeats making them an attractive replacement for antibodies and single-chain variable fragments (scFvs).

Researchers at Arizona State University have developed novel reagents that can distinguish Alzheimer's Disease (AD) from Parkinson's Disease (PD) as well as from other neurodegenerative diseases. A novel DARPin library was created and specific DARPins isolated that were selective for either AD or PD cases with the ability to distinguish between the two. These DARPins were validated on human brain tissue and sera samples. The use of these DARPins on sera provides for a less invasive and more accurate disease-specific diagnostic test.

These reagents enable a more personalized approach for diagnosing and distinguishing between AD and PD patients and may help in monitoring efficacy of treatments or developing more effective treatment strategies.

Potential Applications

- Early stage diagnosis of AD or PD patients
- Development of treatment strategy of AD or PD
  - May also be used to monitor the efficacy of therapeutic agents for AD or PD
- Monitoring the pathology of AD or PD

Benefits and Advantages

- Able to distinguish between AD and PD cases
- Flexible assay format – can use plasma, serum, tissue, and potentially other biological fluids

- More personalized approach for diagnosing AD or PD patients
- These DARPins can serve as excellent indicators of treatment efficacy or progressing pathology
- DARPins are very stable and as such are attractive reagents
- High disease specificity for accurate diagnoses

For more information about the inventor(s) and their research, please see

Dr. Sierk's departmental webpage