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Skin α-synuclein seeding activity as a biomarker of Parkinson's disease

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The pathological alpha-synuclein (αsynp) deposited in the brain is the hallmark of Parkinson's disease (PD). Currently, definitive PD diagnosis often requires the detection of αsynp-containing Lewy bodies in brain tissue. Using the highly sensitive real-time quaking-induced conversion (RT-quic) and protein misfolding cyclic amplification (PMCA) assays, we observed significantly higher seeding activity of αsynp in skin tissue obtained at autopsy or by biopsy from PD patients than those obtained from non-PD controls. With the neuropathologically-confirmed cases, RT-quic revealed that sensitivity was 90% in abdominal and 100% scalp skin samples while both types of tissues had 100% specificity; PMCA revealed 83% sensitivity and 100% specificity with abdominal tissues. With the posterior neck skin biopsy tissues from clinically-diagnosed PD and non-PD cases, RT-quic exhibited 93% sensitivity and 100% specificity, respectively. Our results provide proof-of-concept that the skin αsynp-seeding activity may be a useful biomarker for antemortem diagnoses of PD.

Biography

Wen-Quan Zou received his medical degree from Jiangxi Medical College, his M.Sc. from Tongji Medical University, and his PhD. from Shanghai Medical University. He has practiced Internal Medicine and Nephrology for years in Nanchang and Shanghai, China, as both a physician and an attending physician, respectively. His post-doctoral work in neurodegenerative diseases, with a concentration in prion diseases, was done in the Department of Pathology at the Case Western Reserve University and at the Centre for Research in Neurodegenerative diseases at University of Toronto. Currently, Dr. Wen-Quan Zou is a Professor of Pathology with tenure and Associate Director of the National Prion Disease Pathology surveillance center at the Case Western Reserve University School of Medicine.

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