Rapid New Blood Diagnostic Test for ALS

JACKSON, WY, UNITED STATES, September 13, 2024 /EINPresswire.com/ -- A highly accurate diagnostic blood test has been developed for amyotrophic lateral sclerosis (ALS), a progressive neurodegenerative disease that effects neurons in the brain and spinal cord.

Neurally-derived extracellular vesicles extracted from a standard blood sample contain microRNA sequences used to diagnose ALS. Photograph by Paul Cox.

ALS leads to gradual paralysis, ultimately resulting in the inability to walk, speak, or, in later stages, move. Currently, diagnosis is based on a thorough clinical examination, but it can take up to 12 months to provide a definitive diagnosis, by which time many patients have significantly deteriorated. Misdiagnosis rates vary widely, occurring in as many as 68 percent of cases, further complicating timely and accurate treatment.

Researchers from the not-for-profit Brain Chemistry Labs in Jackson Hole, Wyoming, published the study today in the journal Brain Communications produced by Oxford University Press.

The diagnostic test requires only a simple blood draw and is based on small sequences of nucleic acids, known as microRNA, extracted from tiny vesicles released by the brain and nervous system.

Analysis of microRNA sequences from hundreds of patient samples allowed researchers to develop a unique “ALS fingerprint” comprising eight distinct microRNA sequences. These sequences can sensitively and specifically distinguish blood samples of ALS patients from healthy controls and from patients with conditions that mimic ALS in its early stages, with an overall accuracy of up to 98%.

Scientists hope the test will become a tool to help neurologists make more rapid diagnoses.

Dr. Sandra Banack pipettes blood samples from ALS patients at the Brain Chemistry Labs in Jackson Hole. Photograph by Paul Cox.

“Rapid diagnosis will allow treatment to begin earlier leading to better outcomes for ALS patients,” remarked Brain Chemistry Labs scientist Dr. Sandra Banack, senior author on the paper.

This new test follows on the heels of three prior validation studies using different patient cohorts for a total sample size of 471, with many of the samples provided by the USA National ALS Biorepository.

Dr. Paul Alan Cox, Executive Director of the Brain Chemistry Labs, hopes to make this test widely available within 18 to 24 months to neurologists by securing a diagnostic company partnership.

Brain Chemistry Labs is a 501(c)(3) not-for-profit organization in Jackson, Wyoming that seeks to discover new ways to prevent, diagnose and treat ALS, Alzheimer’s, Parkinson’s and other serious brain diseases. Learn more at www.brainchemistrylabs.org.

The Brain Communications paper, “A microRNA diagnostic biomarker for amyotrophic lateral sclerosis” (DOI 10.1093/braincomms/fcae268) after embargo can be accessed at https://academic.oup.com/braincomms/article-lookup/doi/10.1093/braincomms/fcae268

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