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# Diagnostic and Prognostic Biomarkers for ALS

Amyotrophic Lateral Sclerosis (ALS) is a terminal neurodegenerative disease defined by the progressive loss of motor neuron function. Despite intense research efforts, clinical outcomes in ALS patients have remained limited. Because there are no diagnostic or prognostic biomarkers for ALS, patients are classified based on the site of symptom onset, which poorly captures the pathological heterogeneity in patients.

Researchers at Arizona State University have developed a novel prognostic test which stratifies ALS patients into three distinct subtypes with significant differences in survival. The three ALS subtypes are defined i) glial activation (ALS-Glia), ii) oxidative stress and altered synaptic transmission (ALS-Ox) and iii) transcriptional dysregulation (ALS-TD). Further, they identified transcripts uniquely expressed by a single ALS subtype, offering the ability to assess patient prognosis using endogenous molecular features. These subtypes capture most of the existing disease mechanisms previously associated with ALS neurodegeneration. Further, some of the transcripts have not previously been associated with ALS, offering potential insight into disease pathologies and potential targets for diagnostic or therapeutic development.

These novel transcripts are uniquely expressed by a single ALS subtype, and as such would be great in tests used to stratify patients based on survival.

Potential Applications

- ALS diagnosis and prognosis
- ALS research
- Potential targets for ALS therapeutics

Benefits and Advantages

- The transcripts identified are uniquely expressed by a single ALS subtype
- The three subtypes are mechanistically unique with significant differences in survival

- Further work has shown the transcripts upregulated throughout the CNS of patient samples, allowing for less invasive sampling procedures
- This prognostic model was derived from quantifiable molecular features
- Leveraged a patient cohort large enough to detect significant differences in patient survival

For more information about this opportunity, please see

Eshima et al – Nature Communications - 2023

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

Dr. Smith's departmental webpage

Dr. Smith's laboratory webpage

Dr. Plaisier's departmental webpage

Dr. Plaisier's laboratory webpage