Docket #: S21-294

Methodology to Measure Non-Structural Proteins and RNA species from Human Hair

Stanford inventors have developed a multiomic methodology for identifying and measuring non-structural proteins and RNA species from human hair. This approach will reveal unique biomarker profiles for wellness or diseases that are not currently identified. Measuring these biomarkers in hair helps to identify individuals at risk for poor health outcomes and to study various brain disorders.

Currently, there is no method available to monitor long-term human health. Multiple groups are developing and applying multiomic methodologies to serial blood samples. Yet, collecting blood samples is painful and invasive, and these samples can only provide data at a single time point.

Our invention presents a better multiomic approach as it uses non-invasive sample collection, simplifies sample handing, allows sample processing (less than 3 hours) and storage at room temperature. More importantly, this method can obtain time-series information about ongoing protein expression, gene expression, and metabolic regulation in human body from a single sample of hair, which enables long-term monitoring of human health status.

Stage of development
Proof of concept

Applications

- Protein and RNA extraction from hair samples
- Identifying and measuring biomarkers in human hair
- Studying brain disorders/brain injury
- Identifying human health status

Advantages

- New type of biomarker panels based on hair
- Non-invasive, fast, and easy sample collection
- Provide time-series data

Patents

- Published Application: WO2023086874
- Published Application: 20250012818

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