



TECHNOLOGY

Transformational Electronic Tool for Chemical Analysis: Oxidative Stress Detection

OVERVIEW

Background

Oxidative Stress is the long-term damage to DNA, RNA, lipids and proteins, in otherwise healthy biological cells, due to reactive oxygen species (RON), typically hydroxyl and peroxide ions among others. By damaging genetic information and other metabolic processes, oxidative stress can lead to a number of chronic conditions such as schizophrenia, cardiovascular disease and cancer. Unfortunately, current assays only detect for very narrow and specific signatures of oxidative stress and there is currently no test available that can measure the global state of oxidative stress in serum. Furthermore, it hypothesized that a fast and reliable measure of oxidative stress accompanied by other health markers could lead to early detection of diseases with the aid of modern information technology.

Innovative Technology

Researchers at the University of Maryland have developed a disruptive technology that measures a global signature for oxidative stress in point-of-care settings. Using an iridium reducing salt with simple spectrographs to detect a change in color, UMD's novel assay provides point-of-care clinicians with a cheap, fast and reliable measurement of oxidative stress currently unavailable in the market. Furthermore, utilizing advanced information processing of patient health metrics, this global measure of oxidative stress promises to be an effective indicator of diagnosis and treatment compliance, resulting in faster diagnosis and more effective treatment regimens, thus leading to more efficient patient care. Indeed, recent clinical studies demonstrate that this method can discriminate persons diagnosed with schizophrenia from healthy controls based on their high levels of oxidative stress.

Advantages

- First global measurement of oxidative stress
- Rapid, simple and inexpensive point of care system adaptable to using with mobile devices
- Can be the discriminating factor among many possible diagnoses

Applications

- Reliable point of care estimation of oxidative stress for clinical applications
- Research tool for testing potential drug candidates
- Estimation of antioxidant capacity of various foods

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Additional Information

INSTITUTION

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PATENT STATUS

Pending

EXTERNAL RESOURCES

LS-2017-084