Skysong Innovations
Advancing the Arizona State University Knowledge Enterprise

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Integrated device for surface-contact sampling extraction and electrochemical measurements

With the ongoing discovery of novel biomarkers indicative of numerous diseases, the maintenance of several conditions are contingent on daily monitoring of respective biomarkers. The most commonly sampled body fluid is blood, an example of which is the daily finger prick associated with diabetic blood glucose readings. These procedures are painful and inconvenient, and after prolonged testing, calluses can develop which interfere with further testing. This leaves a window of opportunity for high quality non-invasive daily testing methods.

Researchers at Arizona State University have developed a disposable microfluidic electrochemical sensing device capable of recognizing biomarkers in body fluids, such as tears, saliva, urine and open wounds. This device can be used to detect a plethora of biomarkers including glucose, lactate, uric acid, ascorbic acid, catecholamines, O2, sodium and calcium ions, whole cells, pathogens, viral particles, metal ions and protein biomarkers to name a few.

This novel device provides a simple and painless means for sensitive monitoring of various diseases and conditions. Additionally, it is easily integratable into existing manufacturing lines to allow for seamless and cost-effective production.

Potential Applications

- Non-invasive monitoring of various biomarkers:
  - glucose (diabetes), cortisol (stress), calcium (sarcoidosis), eosinophil cationic proteins (keratoconjunctivitis, celiac disease, Crohn's), acetaminophen (overdose/poisoning), inflammatory cytokines (glaucoma), catecholamines (pheochromocytoma, neuroblastoma), etc.
- Wound assessment - particularly useful in monitoring diabetic ulcers

Benefits and Advantages

- Non-invasive and non-irritating
- Simple - similar to existing BG monitors to ensure widespread adoption
- Integratable into existing manufacturing lines for seamless, cost-effective and scalable production
- Disposable and inexpensive
- Minimal background interference
- Low detection limits: 0.5 to 1.0 mg/dL
- Quantitative measurements

For more information about the inventor(s) and their research, please see Dr. La Belle's laboratory webpage