Portable Surface Plasmon Resonance system for blood marker analysis supporting rapid point-of-care diagnostics and treatment monitoring

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Advances in rapid and point-of-care (POC) diagnosis are critical to gain ground against the high mortality associated with sepsis. Currently, blood biomarkers are analyzed in specialized laboratories by expensive and time-consuming procedures, however unsuitable for life threatening situations, where early detection is vital. To address this challenge, we developed a novel point-of-care system for fast and sensitive detection of biomarkers in blood, enabling early diagnostics (MarkerSense). By providing the means to detect rapidly (~10 min.), on-site and conveniently (using a single drop of blood) key parameters for assessing sepsis risk, MarkerSense will offer clinicians a valuable tool, allowing them to optimize and personalize the treatment and improve clinical outcome for the patients. Based on a proprietary Surface Plasmon Resonance technology developed by International Centre of Biodynamics[1,2] and a low-cost functionalization platform[3] optimized for high-sensitivity and reduced non-specific binding, MarkerSense simultaneously performs high signal-to-noise ratio reflectivity and phase angle resolved assays, in a portable format. The functionalization layer was tested for nonspecific binding and the limit of detection for a sepsis marker (*i.e.* soluble CD25) was ~2 ng/ml, as compared to relevant concentrations[4] for early diagnosis of sepsis (~3 ng/ml). Following successful clinical trials, MarkerSense is envisaged to be used for rapid on-site diagnosis of sepsis in hospitals (ICU, emergency departments).

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