FILTER-BASED SERS SUBSTRATES FOR CORTISOL MEASUREMENT

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This study presents a novel filter-based Surface Enhanced Raman Scattering (SERS)substrate for the sensitive detection of cortisol, a key biomarker for stress levels that is produced by the adrenal glands. The filter is pre-treated with methanol and NaCl aqueous solution, followed by the deposition of silver nanoparticle (AgNP) deposition using a low-pressure suction filtration technique. The pre-treatment involves the gradual addition of methanol to the filter using low-pressure suction filtration technique and a subsequent 10-minute soaking the filters in NaCl aqueous solution. The AgNP are deposited using the Silver Mirror Reaction (SMR) technique. The enhancement of the filter is demonstrated by comparing the Raman spectrum of reference materials such as Rhodamine with a standard commercial silver substrate. The limit of detection (LOD) for both Rhodamine and cortisol are estimated and compared with Attenuated Total Reflection-Fourier Transform Infrared Spectroscopy (ATR-FTIR) and a commercial silver substrate.