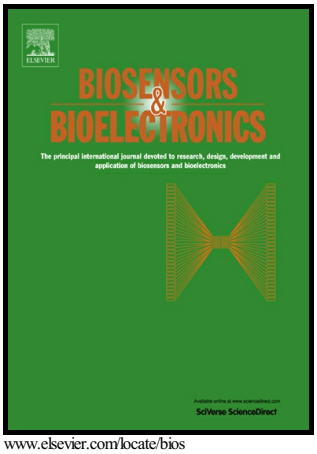

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ABSTRACT

An autoantigen piezoelectric sensor to quantify specific circulating autoantibodies in human serum is developed. The sensor consisted on a quartz crystal microbalance with dissipation monitoring (QCM-D) where TRIM21 and TROVE2 autoantigens were covalently immobilized, allowing the selective determination of autoantibodies for diagnosis and prognosis of Systemic Lupus Erythematosus (SLE). The sensitivity of the biosensor, measured as IC_{50} value, was 1.51 U/mL and 0.32 U/mL, for anti-TRIM21 and anti-TROVE2 circulating autoantibodies, respectively. The sensor is also able to establish a structural interaction fingerprint pattern or profile of circulating autoantibodies, what allows scoring accurately SLE patients. Furthermore, a statistical association of global disease activity with TRIM21-TROVE2 interaction was found (n = 130 lupic patient samples, p-value = 0.0413). The performances of the biosensor were compared with standard ELISA and multiplex DVD-array high-throughput screening assays, corroborating the viability of piezoelectric biosensor