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ABSTRACT

Ratiometric quantification for competitive immunoassay based on internal standard element detection utilizing inductively coupled plasma mass spectrometry (ICP-MS) as multiplex readout has been demonstrated. The Beta-2-microglobulin (β2-MG) associated with clinical diseases was detected by Y-labeled capture antibody used as internal standard probes and Sm-labeled antigen used as report probes via antigen-antibody reaction. The ratiometric quantification was achieved by taking the signal ratio of Sm/Y. The ratiometric method could compensate for the particle loss and suppress the signal fluctuation, which improved the precision of the quantitative result. Under the optimized conditions, the calibration curves for β2-MG antigen was linear in the range of 0.25-8.0 μg/mL with a detection limit of 0.17 μg/mL (3σ, n = 11). The recoveries of 96.5% - 132% were obtained for serum samples spiked with different concentration standards, and the relative standard deviation (RSD) was less than 10%. The β2-MG results in serum samples obtained by the proposed method correlated well with those obtained by