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## Quantitative analysis of prostate specific antigen isoforms using immunoprecipitation and stable isotope labeling mass spectrometry

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Prostate specific antigen (PSA) is a widely used serum marker for prostate cancer (PCa), but has limited specificity for distinguishing early PCa from benign prostatic hyperplasia (BPH). Recently, proPSAs comprised of native proPSA as well as truncated proPSA forms [-2] proPSA, [-5] proPSA and [-7] proPSA, have been shown to be better diagnostic targets than PSA for PCa. Stable isotope labeling-multiple reaction monitoring mass spectrometry (SIL/MRM-MS) has been frequently used to measure low-abundance biomarkers in tissues and biofluids owing to its high sensitivity, specificity, simplicity and multiplexing capability. In this study, we have developed and optimized a strategy using immunoprecipitation in conjunction with SIL/MRM-MS assay which is capable of sensitive and accurate quantification of proPSA in serum. Since serum and plasma are most complex biological fluids, the immunoprecipitation workflow is optimized to achieve sufficient sensitivity, efficiencies of protein purification with immuno affinity depletion. The developed strategy can detect proPSA and PSA with a limit of detection (LOD) and limit of quantitation (LOQ) at ng/mL levels corresponding to a concentration six orders-of-magnitude lower than the most abundant serum proteins. Furthermore, the simultaneous measurement of multiple biomarkers including the mature and precursor forms of PSA can be achieved in a single multiplexed analysis using LC/MRM-MS. The strategy demonstrated here provides an attractive alternative to ELISAs or RIAs for the reliably measurement of proPSA to improve the specificity of PCa diagnosis.

### Biography

Sung-Fang Chen completed his PhD at Cleveland State University (CSU) (a joint program in the field of Clinical-Bioanalytical Chemistry at Lerner Research Institute of the Cleveland Clinic) in 2000. After having a Post-doctoral training at the Institute of Chemistry, Academia Sinica, Taiwan, he took a position of Research Manager at the Biomedical Engineering Center, Industrial Technology Research Institute in 2002. He joined National Taiwan Normal University as a Faculty member in 2009 and has been an Associate Professor since 2013.

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