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Clinical proteomics for biomarker discovery and verification of bladder cancer

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Bladder cancer is potentially lethal and is a costliest urological malignancy to manage. Base on the morbidity and mortality, diagnosis and treatment of the cancer are important issues for the better clinical practice. To discover potential biomarkers of bladder cancer, we employed a strategy combining isotopic labeling and LC-MS/MS analysis to profile proteomic changes in secretome, clinical urine, urine microparticles, and fresh-frozen bladder tumor specimens. Seven differentially-expressed proteins have been selected as potential biomarker candidates for verification by immuno-assays or multiple-reaction-monitoring MS in more clinical specimens. Overall, the urinary concentrations of the classical plasma proteins or acute phase proteins show the best AUC values for discrimination between age-matched control and bladder cancer patients. Proteomic analysis of urinary microparticles reveals strong association of TACSTD2 with bladder cancer. TAGLN2 shows the most significant overexpression in bladder cancer tissues and might be a useful molecular tumor marker for evaluating bladder cancer lymph node metastasis. Urinary TAGLN2 also represents a potential biomarker for non-invasive screening of bladder cancer. Our findings highlight the value of integration of multiple clinical proteomes in providing valuable information for protein origin, specificity and application for future validation studies of potential biomarkers in bladder carcinoma.

Biography

Yi-Ting Chen received her Ph.D. degree in Department of Chemistry from the National Tsing Hua University, Taiwan. From September 2007, she worked at Molecular Medicine Research Center of Chang Gung University (CGU) with focusing on urinary protein biomarker discovery. Being an assistant professor in Department of Biomedical Sciences of CGU since 2013, Dr. Chen's research interests focus on proteomics, metabolomics and systems biology of urological diseases and advanced method development for detection of disease-associated biomolecules, primarily based on mass spectrometry. Dr. Chen participates in several integrated research programs and serves as an investigator for translational application of omics studies.

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