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Discovery and validation of protein biomarkers for lung cancer metastasis using a cell secretome model and clinical specimens

As the leading cause of cancer death worldwide, Lung cancer lacks effective diagnosis tools and treatments to prevent its metastasis. Metastasis is a major obstacle that must be overcome for the successful treatment of lung cancer. Proteins secreted by cancer cells may facilitate the progression of metastasis, particularly within the phases of migration and invasion. To discover metastasis promoting secretory proteins within cancer cells, we used a Hollow Fiber Culture (HFC) system and mass spectrometry based label free quantitative proteomics approach to compare the secretomes from the lung adenocarcinoma cell lines CL1-0 and CL1-5, which exhibit low and high metastatic properties, respectively. Among the 703 proteins quantified, 50 of which were expressed at different levels between the two cell lines and considered to be potentially useful biomarkers for lung cancer metastasis. Several of those candidates for useful protein markers, such as COL6A1, A1AT, PARK7, ACTN4 and TIMP-1 were further examined and validated using cell functional assays and clinical specimens for their possible applications in lung cancer prevention and treatment.

Biography

Pao-Chi Liao has completed his PhD in Analytical Chemistry from Michigan State University (MSU) in 1995 and completed his Postdoctoral Research in the Department of Biochemistry at MSU. He has joined the Faculty at Department of Environmental and Occupational Health, National Cheng-Kung University, Taiwan in 1997, where he was promoted to full Professor in 2006 and named Distinguished Professor in 2011. His research interests and fields of specialty include analytical chemistry, mass spectrometry, proteomics, biomarker discovery, cancer biomarkers, lung cancer metastasis and environmental and occupational health.

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