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Clinical metabonomics for biomarker discovery of malignant pleural effusions (MPE)

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Aim: Clinical metabonomics has been widely used in advanced laboratory medicine for the study of disease mechanism and biomarker discovery. Here, we will extend the use of clinical metabonomics to develop new screening test for malignant pleural effusions (MPE).

Methods: 32 malignant and 18 non-malignant PE samples will be analyzed using reversed-phase liquid chromatography-tandem mass spectrometry (LC-MS/MS). Biomarkers for MPE will be determined by metabolome-wide association studies (MWAS) using Receiver Operating Characteristic Curve Explorer and Tester (ROCCET). All markers will be filtered using a metabolome-wide significance level (MWSL) at p-value ≤ 2×10−5.

Results: 2731 and 3137 markers were detected in positive and negative ESI spectra respectively. Free fatty acids (FFAs) 16:0, 18:1 and 18:2 were significantly increased in MPE. FFA 18:1 (oleic acid) showed the largest area-under-ROC of 0.96 (95% CI: 0.87–1.00) with sensitivity of 84% and specificity of 100.0% (p-value: 8.23×10−8).

Discussion: Pleural fluid oleic acid is a novel biomarker for screening MPE.

Biography

Professor Lam obtained his MBChB from The Chinese University of Hong Kong in 1991 and FRCPA in 1997 from The Royal College of Pathologists of Australasia with a double scope of practice in Chemical Pathology and Genetics. He is a Fellow of The Australasian Association of Clinical Bicohemists. He obtained his PhD in 2000 from The Chinese University of Hong Kong. He obtained FRCP(Glas) from The Royal College of Physicians and Surgeons of Glasgow in 2012. Professor Ching-Wan Lam is The Editor, Clinical Chimica Acta, an official journal of The International Federation of Clinical Chemistry and Laboratory Medicine.

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