

Lectin magnetic bead array-coupled mass spectrometry for the discovery of glycoform-specific serum biomarker

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Cancer-associated alterations in glycosylation of serum proteins have recently come to attention as useful biomarkers, with potential to be more specific and sensitive than protein biomarker. To facilitate the discovery of serum glyco-biomarkers, we have developed a new high throughput method, lectin magnetic bead array (LeMBA), which utilizes individual lectins with different glycan binding affinities to enrich for the sub-glycoproteome in one-step. The lectin magnetic beads are arrayed in a microplate and a liquid handler is used for the procedure. Isolated glycoproteins are trypsin-digested on-bead and the released peptides are identified by LC-MS/MS. Further, we have developed a database for data storage and analysis. LeMBA fulfilled many prerequisites for a biomarker discovery platform, namely, high-throughput, sensitivity and linearity (1). We have applied LeMBA-MS to identify serum biomarkers for canine haemangiosarcoma, a cancer of the endothelium common in large breed dogs, and is a potential natural model for human angiosarcoma. The screen identified a number of candidates showing differential lectin binding between cancer and control sera. Verification screens are being performed using selected lectin panel and targeted MS/MS.

Biography

Dr Michelle Hill received a PhD in cell biology from the University of Queensland (UQ), Brisbane, Australia. Following post-doctoral work at Friedrich Miescher Institute for Biomedical Research, Trinity College Dublin, and the Institute for Molecular Biosciences UQ, Dr Hill established the cancer proteomics group at UQ Diamantina Institute. Current major focus is on the role of caveolin and lipid rafts in cancer progression and cancer biomarker discovery using lectin magnetic bead array. She is an organizing member of Australasian Proteomics Society and Queensland Proteomics Discussion Group and serves on the editorial boards of international proteomics and cell biology journals.

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