Proteomic analysis of human pancreas cancers for the identification of targetable biomarkers

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Pancreatic ductal adenocarcinoma is characterized with poorest prognoses among all major human cancers. Hence novel diagnostic and treatment modalities, such as targeted antibody based therapy, are required. The purpose of this study is therefore to identify tumor associated antigens in human pancreatic cancer specimens. These should preferentially be abundant in the tumor and accessible via bloodstream deliverable agents. Here, pancreatic tissues obtained from surgical resections of 4 individuals were soaked in EZ-link Sulfo NHS-SS-biotin solution. The biotinylated proteins were captured by streptavidin affinity chromatography and the peptides derived from tryptic digestion were analyzed using the 2D-HPLC-MS/MS technique. Twenty four proteins were identified as accessible and differentially expressed in cancer as compared to normal pancreas. Of these, six proteins have been found in previous studies to be associated with pancreatic cancer whereas 14 have been known to be differentially expressed in other types of tumor. The remaining proteins were novel in the context of the pancreas tumor pathology. The differential expression pattern of potential antigens was validated by immunohistochemistry. In conclusion, the present study identified a set of accessible proteins that may be used as antigens for the antibody-based therapy of pancreatic cancer. Our data have shown the feasibility of using a biotinylated strategy to generate protein expression profiles and identify accessible proteins as potentially therapeutic targets.