Proteomic discovery of biomarkers for the diagnosis of lymph node metastasis in gastric cancer; application of 2D-DIGE using surgical samples

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Gastric cancer is the most common malignancy in eastern countries. Presence of lymph node metastasis (LNM) is major unfavorable prognostic factor. Pretreatment accurate diagnosis of LNM is essential for the decision of adequate treatment strategy. However, existing diagnostic tool, i.e., computed tomography is insufficient for diagnostic sensitivity because it is based on the morphological findings of the lymph node. We aimed to identify biomarkers associated with cancer molecular mechanism using proteomic approach, which were useful for the diagnosis of LNM. Forty-four tumor tissues (28 LNM-positive and 16 LNM-negative tumors) and adjusted non-tumor mucosae were obtained from surgically resected stomach. Laser microdissection was useed to recover specific tumor or non-tumor epithelial cells.[1]Protein expression profiles of these microdissected samples were created by two-dimensional difference gel electrophoresis (2D-DIGE).[1]A total of 3,350 protein spots were detected, and intensities of 237 spots had statistical significant differences between tumors and non-tumors (p-value < 0.01, fold differences > 2.0). In these spots, comparative study revealed the protein spots whose intensity was different between LNM-positive and LNM-negative tumors. Mass spectrometry using LC-MS/MS identified unique proteins to LNM-positive tumors. These proteins are considered as useful biomarker candidates for diagnosis of LNM in gastric cancer.

Keywords:
gastric cancer / lymph node metastasis / laser microdissection / 2D-DIGE / mass spectrometry

Reference
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