Proteomic study revealed APC-binding protein EB1 has malignant potentials of colorectal cancer

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This study aimed to reveal proteome backgrounds of colorectal cancer (CRC) and identify biomarkers to assess the malignant potentials of the CRC cases. The surgically resected normal and tumor tissues from 59 CRC patients were examined using 2D-DIGE with Cydye DIGE Fluor saturation dyes and our original large format gel apparatus. The protein identification was carried out by LC-MS/MS. The Mascot software was used to search for the mass of the peptide ion peaks against the SWISS-PROT database. We performed immunostaining validated the relation between the protein expression and clinical parameters. Moreover, RNAi assays were achieved to examine the functional significance of the identified protein in the CRC cell lines. 2D-DIGE and MS experiments revealed that APC-binding protein EB1 (EB1) had higher expression in tumor tissues (47 of 59 cases), compared with normal ones. Following immunohistochemical studies revealed that EB1 was rarely expressed in colorectal adenoma (3 of 19 cases), and EB1 was highly expressed in tumor tissues from 150 of 176 CRC cases examined. Multivariate analyses in 132 CRC cases with survival data indicated that nuclear EB1 was associated with the shorter survival (p = 0.02) as well as lymph node metastasis (p < 0.001), and liver metastasis (p < 0.001). Moreover, silencing of EB1 resulted in the reduced cell proliferation and invasion. In conclusions, we found the association of EB1 with malignant potentials of CRC and its possible clinical utilities. EB1 will be worth further investigating for its clinical applications.

Keywords: Colorectal cancer, 2D-DIGE