S1-3

Proteomics of Gastric Cancer

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Proteomics aims at the global analysis of tissue and cellular proteins, and uses a combination of techniques including two-dimensional gel electrophoresis (2-DE), image analysis, mass spectrometry, and bioinformatics to resolve comprehensively, to quantify, and to characterize proteins. Through comparative proteome analyses, proteomics offers the possibility of identifying disease-associated protein markers to assist in diagnosis or prognosis and to select potential targets for specific drug therapy. Recently, such an approach has been applied to the molecular analysis of various human cancers such as bladder, colorectal, and breast cancers.

We have launched a gastric cancer proteomics project two years ago, with the support of the 21st Century Frontier / Functional Analysis of Human Genome R & D Program of Korean Ministry of Science and Technology. The project objectives are establishment of a cancer tissue banking system, and high level facilities and technologies for proteome analysis, and finding candidates for gastric carcinoma-associated proteins via comparative proteomic analysis of tumor and normal tissues. A progress report will be presented for the work on proteomics of gastric cancer which has been done since last two years.

S1-4

Causal relationship between the loss of RUNX3 expression and gastric cancer

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The human runt-related gene RUNX3/PEBP2aC, located on chromosome 1p36, is a major mediator of signals elicited by members of the transforming growth factor-b (TGF-b) superfamily. Here we show that 45-60% of gastric cancer cell lines and surgically resected specimens do not significantly express RUNX3 due to a combination of hemizygous deletion and hypermethylation of the RUNX3 promoter region. Tumorigenicity of gastric cancer cell lines in nude mice was inversely related to their level of RUNX3 expression, and one gastric tumor associated mutation (R122C), occurring within the conserved Runt domain completely abolished the tumor suppressive effect of RUNX3. The results suggest that a lack of RUNX3 function is causally related to the genesis and progression of human gastric cancer.