Abstract of Presentation

Note: This paper should be typed in "Times New Roman" of 12pt.

Presentation Title(Should be no more than 20 words):

Cancer Biomarker and Drug Target Discovery by Proteomics

Abstract :

Protein expression is not always correlated with mRNA expression (1), and it is anticipated that alterations in the protein content of clinical samples more directly reflect the biological and pathological status of patients. Recent advanced proteomic technologies have been increasingly applied to studies of clinical samples to identify biomarkers that could facilitate early cancer detection (2), tailoring of cancer treatments (3), and therapeutic target discovery (4).

Matrix-assisted laser desorption/ionization (MALDI) mass spectrometry (MS) is becoming a method of choice for profiling of clinical samples owing to its high sensitivity and throughput. We previously identified a set of biomarkers that can detect pancreatic cancer with a high degree of accuracy (2). We recently accomplished a large-scale multi-cohort validation study in which 8 medical institutions in Japan and Germany participated (submitted for publication).

However, only low-molecular-weight proteins can be analyzed by MALDI-MS, and a method allowing more comprehensive protein profiling is therefore desirable. Shotgun proteomics is an emerging concept in which whole proteins are enzymatically digested into a large array of small peptide fragments having uniform physical and chemical characteristics, and then analyzed directly by MS (3). The sensitivity of shotgun proteomics can be greatly increased by high-performance liquid chromatography (HPLC) with a flow rate of the nanoliter-per-minute order (5). In this presentation I would like to introduce our current MS-based approaches to biomarker and therapeutic target discovery.

1) Yamaguchi et al., J Clin Oncol. 2008 Sep 1;26(25):4100-8.

2) Honda et al., Cancer Res. 2005 Nov 15;65(22):10613-22.

3) Matsubara et al., J Clin Oncol. 2009 May 1;27(13):2261-8..

4) Huang et al., Gastroenterology. 2007 Nov;133(5):1569-78.

5) Shitashige et al., Gastroenterology. 2008 Jun;134(7):1961-71, 1971.e1-4.