Identification of STIP-1 as a Diagnostic and Therapeutic Biomarker Candidate for Ovarian Cancer by two-dimensional DITA

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Objective : The purpose of this study was to investigate new diagnostic and therapeutic biomarker candidate using the difference of autoantibodies level in the serum proteome of ovarian cancer patients before and after treatment

Methods : We used two-dimensional differential gel eledtrophoresis analysis of immunoprecipitated tumor antigens (2D-DITA) to identify relevant autoantibodies between pre-operative and post-operative serum samples of 14 ovarian cancer patients. Real-time quantitative reverse transcription polymerase chain reaction (RT-PCR), immunohistochemistry (IHC) were used to validate selected candidate biomarker by quantitative determination of specific proteins in all individual serum samples. Plasma level of selected biomarker candidate was measured by an enzyme-linked immunosorbent assay (ELISA). Ovarian cancer cell lines were transfected with the small interfering RNA (siRNA) and the effect of cell proliferation, invasion, migration and apoptosis were assessed.

Results : 2D-DITA showed that stress-induced phosphoprotein-1 (STIP-1) was highly expressed 3.45 fold on in serum level from pre-treated patients compared with post-treated ovarian cancer patients with statistical significance ($p<0.05$). Real-time RT-PCR and IHC studies revealed that mRNA and protein of STIP-1 were highly expressed in ovarian cancer but nearly absent in normal cell-lines and tissues($p<0.05$). Plasma STIP-1 level was significantly higher in ovarian cancer patient compared with the control group($p=0.005$). Knockdown of STIP-1 with siRNA resulted in a significant reduction of tumorigenesis.

Conclusion : These results suggest that STIP-1 is a potentially useful diagnostic marker and possible therapeutic target for ovarian cancer. Further research assessing their putative clinical usefulness would be worthwhile.