

Detection of Conformational Change of Protein Using Surface Plasmon Resonance (SPR) Imaging System

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The abbreviations used are: SPR, surface plasmon resonance; TNF, tumor necrosis factor; TRAIL, TNF-related apoptosis-inducing ligand

ABSTRACT

Antibody chip has been shown to be used to analyze protein expression in a cell extract or serum with specific antibody for target protein. In contrast, little is performed for monitoring the structurally changed protein using antibody chip. Thus, we describe an antibody chip technology in order to examine the conformational change of protein using surface plasmon resonance (SPR) imaging system. In this study, we used Bax protein, a pro-apoptotic member of the Bcl-2 family of proteins, as a model protein to investigate conformational alteration triggered by TNF-related apoptosis-inducing ligand (TRAIL), a potent inducer of apoptosis. For developing antibody chip to de-

tect Bax conformational change, we immobilized Bax monoclonal antibody 6A7 that recognized only the conformationally changed Bax protein onto gold surface. As results, the immobilized Bax antibodies provided specific and accurate measurements of the active conformation-specific epitope in the apoptotic cancer cells treated with TRAIL, which corresponded to the data obtained by immunoprecipitation analysis with active conformation-specific Bax-antibody (6A7). Our results indicated that TRAIL-induced Bax structural change can be quickly and simply monitored by SPR imaging system, providing a potential tool for the analysis of conformational properties of target proteins.