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Poster presentation

Global profile of genes regulated by securin

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Securin is a proto-oncogene that plays a pivotal role in cell division, sister chromatids separation and pancreatic beta cell proliferation. Over-expression of securin in normal cells results in cellular transformation and development on tumor in nude mice. On the other hand, depletion of securin from cancer cells results in suppression of tumor and reversal of cancer phenotype in vitro and in vivo. In many cases securin acts as a transcription factor and regulates the expression of important target genes. However, only a few target genes have been identified. Therefore, we used a quantitative microarray assay to identify the genes that are regulated by securin in a human embryonic kidney cell line (HEK293) that do not express securin or express at a very low level. We infected HEK293 cells with empty adenovirus, adenovirus expressing GFP or adenovirus expressing securin. Infection of cells with adenovirus expressing securin for 48 h resulted in alterations in the levels of expression of genes that ranged in magnitude from 1.1- to 42-fold, with a total of 313 genes exhibiting a p value < 0.05 compared to control adenovirus or adenovirus expressing GFP protein. Infection of HEK293 with adenovirus expressing securin was found to affect the expression of a diverse range of genes, including oncogenes and those that encode transcription factors, ion channel proteins, and cytoskeletal proteins as well as other proteins that are involved in signal transduction, the cell cycle, cell proliferation and apoptosis. The altered expression of some of these genes that were found by microarray analysis to be regulated by securin was confirmed by semiquantitative reverse transcriptase-polymerase chain reaction. The application of the microarray technique should prove to be a powerful tool for future analysis of the mechanisms by which securin regulates tumorigenesis.

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