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Transcription Factor Ets-1 Regulates Matrix Metalloproteinase-9 Expression in Human Breast Cancer

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Abstract—*Ets-1 is one of the founder member of Etstranscription family which share a unique DNA binding domain. It is predominantly expressed in various tumors and its association has been shown in the regulation of various genes which include ECM-degrading proteases. The aim of our study was to understand the mechanism(s) in the pathogenesis of breast cancer by Ets-1 transcription factor and the regulation of its downstream target gene MMP-9. Silencing ofEts-1by RNA-interference in combination with pull down and ChIP assays to identify the regulation of MMP-9 inMCF-7 and MDA-MB-231 breast cancer cell lines. mRNA and protein expression levels were checked using real time PCR, western blotting and immunofluorescence. In addition, the effect on cell invasion and EMT markers and the binding site of Ets-1 transcription factor on MMP-9 promoter was also checked. Ets-1 knock down resulted in down regulation of MMP-9 and also resulted in reduced cell invasion and in altered expression of EMT markers. Pull down and chip assay confirmed a direct role of Ets-1 transcription factor in MMP-9 transactivation. The study suggests the molecular mechanism of Ets-1 mediated cancer growth and its effect on downstream target MMP-9, and the possible role of targeting Ets-1 in breast carcinogenesis.*