



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

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<b>Project Title</b> Regulation of Fibronectin Expression by EGR1 in Prostate Cancer Cells	
<b>Abstract</b> <b>Objectives/Goals</b> Being the second highest cause of cancer related death among men in the United States of America, prostate cancer urgently requires new approaches to be diagnosed and further treated. The purpose of this project was to develop a better understanding of the genetic regulation involved in prostate cancer cells. Specifically, the role of Early Growth Response Gene 1(EGR1) in regulating Fibronectin (FN1) gene expression in prostate cancer cells was tested. <b>Methods/Materials</b> Expression of EGR1 and FN1 genes was measured by polymerase chain reaction (PCR). PCR products were analyzed by agarose gel electrophoresis. All PCR reagents were from Life Technologies Inc. PCR was carried out using standard procedures for 30 cycles. The DNA fragments separated on gel were visualized by staining with Gel Red dye (Biotium Inc.) and photographed on a UV-transilluminator system. The intensities of various bands were compared by scanning the gel and using software to quantitate the signal. <b>Results</b> PCR provides a highly sensitive approach to measure gene expression in a semi-quantitative manner. First, PCR conditions were standardized for measuring cellular expression of FN1 and EGR1, using Actin expression to normalize results. Next, 3 prostate cancer cell lines were analyzed by PCR to survey the relative expression levels of FN1 and EGR1 genes in these cell lines. Expression of both EGR1 and FN1 was readily detectable in DU145 and 22RV1 cells. In contrast, PC3 cells failed to show EGR1 expression and also had little FN1 expression. Increase in EGR1 expression by transfection of EGR1 expression plasmid, but not a control plasmid, in 22RV1 cells resulted in a corresponding increase in FN1 expression, indicating a correlation between EGR1 and FN1 expression levels. Further, inhibition of EGR1 expression using an antisense approach resulted in a corresponding downregulation of FN1 expression in antisense EGR1 transfected cells, but not in mock transfected cells. Thus, EGR1 appears to regulate FN1 expression levels in 22RV1 prostate cancer cells. <b>Conclusions/Discussion</b> FN1 expression appears to be regulated by EGR1 transcription factor in prostate cancer cells. EGR1 may play an important role in prostate cancer, and should be studied further to develop novel interventions against prostate cancer.	
<b>Summary Statement</b> In order to better understand the role of EGR1 in prostate cancer, the regulation of EGR1 and one of its target genes, FN1, was studied in prostate cancer cells.	
<b>Help Received</b> Entire project was performed under the supervision of Dr. Veronique Baron at VRISD	