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## GENE EXPRESSION OF BCL-2 FAMILY AND PROTEINS INVOLVED IN THE MITOCHONDRIAL TRANSPORT SYSTEMS (VDAC AND TOMM) AS POSSIBLE MARKER FOR PROSTATE CANCER

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### **Background:**

One of the pathomechanisms of prostate carcinogenesis is losing the ability of epithelial cells in the prostate gland to accumulate zinc. Zinc may induce apoptosis in prostate tissue through release of cytochrome c and other proapoptotic molecules which is regulated by Bcl-2 family protein. Cytochrome c release is associated with the transport system in the mitochondrial membrane. However, it is not clear, whether cytochrome c is released through VDACs (voltage dependent anion channels) or by the involvement of the TOMM (translocase of outer mitochondrial membrane) complex protein. Both play a role in molecule transport through the outer mitochondrial membrane. The aim of this study is to investigate mRNA expression of Bcl-2 family (proapoptotic Bax and Bid, antiapoptotic Bcl-2), VDAC isoforms and TOMM isoforms genes.

### **Methods:**

The levels of mRNA expression of Bcl-2 family (proapoptotic Bax and Bid, antiapoptotic Bcl-2), VDAC isoforms (VDAC1, VDAC2, VDAC3) and TOMM isoforms (TOMM20, TOMM22, TOMM40) genes were analyzed by custom designed quantitative PCR array (SAB Biosciences) method in 13 paraffin embedded prostate cancer tissue and 5 normal prostate tissue as control.

### **Results:**

We found a significant increase of mRNA expression of antiapoptotic Bcl-2 and VDAC1 genes in prostate cancer tissue compared to normal tissue. There is no significant difference in mRNA expression between the proapoptotic Bax and Bid genes, the VDAC2 and the VDAC3 isoform as well as the three TOMM isoforms in prostate cancer tissue and normal tissue.

### **Conclusion:**

It is already known that VDAC1 especially N-terminus domain interacts with Bcl-2 protein to induce apoptosis. This is in accordance with our results that showed increase of Bcl-2 followed by VDAC1 transcript. How the mechanism of VDAC1 play a role in prostate carcinogenesis remains unclear however. Our results provide the first evidence that both Bcl-2 and VDAC1 play a role for prostate carcinogenesis and could be used as diagnostic biomarkers in the future.

**Keywords:**

Bcl-2 Family, VDACs, TOMM Complex, PCR Array