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Differential gene expression between African American and Caucasian American prostate cancer

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Background. African-American (AA) men have higher incidence and mortality from prostate cancer compared to Caucasian-American (CA) men. Increasing evidence suggests that genetic and molecular alterations play important roles. We identified a 5 gene panel viz. p-Akt (Ser473), chemokine (C-X-C motif) receptor 4 (CXCR4), fatty acid synthase (FASN), interleukin-6 (IL-6) and matrix metallopeptidase 9 (MMP-9) highly expressed in prostate cancer and analyzed their expression in AA and CA cohorts.

Methods. IHC of p-Akt, CXCR4, FASN, IL-6 and MMP-9 were evaluated in RRP specimens (n=20) from each ethnic group exhibiting Gleason scores ranging from 6 through 9.

Results. Low to medium staining for p-Akt and weak focal staining for MMP-9 was observed in the cytoplasm of tumor cells (10-20%) in <20% specimens in both groups; whereas moderate to strong cytoplasmic expression of FASN was noted in >80% of tumor cells in both groups. Expression of IL-6 varied from weak to moderate intensity between (20-100% tumor cells) in 85% cases in CA- and 75% in AA-specimens. A marked difference in CXCR4 expression was noted between AA- and CA- cancer specimens. Weak CXCR4 staining was noted <5% of CA- specimens; whereas >85% of AA- prostate cancer exhibited weak to strong CXCR4 expression in between 10-100% of tumor cells localized in membrane, cytoplasm and nucleus in high-grade tumors.

Conclusions. CXCR4 expression appears to be distinctly different in prostate cancers from AA and CA men. Further studies are needed to assess whether this distinction correlates with prognosis between racial groups.

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