Prostate Carcinomas in African Americans Have Distinct miRNA Expression and Biological Markers for Poor Prognosis

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African American (AA) men are disproportionately affected by prostate cancer (PCa), with almost twice the incidence and mortality as compared to non-Hispanic Whites. AA have been left out of research and clinical trials to determine cancer biology, resulting in gaps throughout medical literature. In this study, demographic, pathological and molecular features of PCa in AA were characterized to determine the biological basis of disparities. Formalin-fixed paraffin-embedded tissues from 91 primary and 23 metastatic PCa cases with their clinico-pathological data were retrieved. Tissue expression of Programmed Cell Death 1 (PD-1), Programmed Death-Ligand 1 (PD-L1) and Mismatch Repair (MMR) proteins was assessed by immunohistochemistry. miRNA expression of 24 cases of primary PCa and normal prostate tissue was measured by in situ hybridization. Multivariate analysis was conducted by Spearman's rank-correlation. A distinct pattern of miRNA expression and specific miRNA associated with highly aggressive PCa in AA were identified in tumor tissue. PD-1 and PD-L1 expression was higher in metastatic than primary PCa, thus making AA metastatic PCa patients more amenable to immunotherapy. MMR protein expression was largely intact in both primary and metastatic PCa cases. Smoking correlated with features of aggressive primary PCa. The biological characteristics (high PD-1/PD-L1, intact MMR and distinct miRNA signature) identified in our cohort are biological indicators of poor outcomes in AA men. This characterization of PCa can empower physicians to create individualized treatment plans for AA patients. The miRNA panel identified in this study can help with early diagnosis and prediction of prognosis of PCa in AAs.

Awards Won:
First Award of $3,000