Integrin-Free Tetraspanin CD151 as a Biomarker of PSA-Relapse in Prostate Cancer

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High morbidity and mortality rates of prostate cancer are associated with unexpected metastatic dissemination. Numerous tests exist to help with diagnosis; however, there is a lack of clinical biomarkers to provide accurate prognosis and identify patients at high risk of disease progression. The expression of tetraspanin CD151-free (non-integrin associated CD151) has been previously correlated with poor patient outcome. This study investigated the prognostic potential of CD151-free and assessed the relationship between CD151 and its associated integrin, integrin alpha3. Fluorescence immunohistochemistry was performed for CD151 and integrin alpha3 on prostate cancer tissue and normal tissue in a tissue microarray. Protein expressions in tissue samples were quantified using a Fiji macro through a pixel-by-pixel analysis, and the values were correlated with patient clinical records. As disease progresses, integrin alpha3 expression decreased and CD151-free expression increased. Patients with low integrin alpha3 expression showed significantly increased risk of PSA-relapse compared to those with high expression. Multivariable Cox regression analysis revealed that CD151-free and integrin alpha3 are both significant independent predictors of biochemical recurrence in prostate cancer patients after prostatectomy. In conclusion, CD151-free and integrin alpha3 are both promising prognostic biomarkers and targets in prostate cancer.