Altern Integr Med 2017, 6:7(Suppl)
DOI: 10.4172/2327-5162-C1-039

The role of SR-BI in prostate cancer

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Human prostate cancer represents one of the most frequently diagnosed cancers in men worldwide. Despite being a slow growing type of tumor, prostate cancer can potentially give rise to aggressive and metastasizing forms of cancer. Recent data indicate that elevated cholesterol levels in the plasma are a prerequisite for prostate cancer progression and the risk for prostate cancer has been associated with a high fat, high cholesterol diet and the presence of hypercholesterolemia. Cellular cholesterol is either synthesized by the cells themselves or exogenous cholesterol is taken up with the help of receptors. Cholesterol uptake is mainly mediated via the high-density lipoprotein receptor, also called SR-BI, and the low-density lipoprotein receptor, LDLR. In normal tissue, SR-BI is expressed in the liver and in steroidogenic tissues, where cholesterol uptake is necessary for steroid hormone synthesis. SR-BI has been linked to several types of cancer, including nasopharyngeal cancer, colorectal cancer, ovarian cancer and breast cancer. Recently, growing evidence furthermore suggests a role of SR-BI in prostate cancer. SR-BI has been linked to prostate cancer development, specific antigen secretion and viability of prostate cancer cells. Moreover, SR-BI was found to be significantly up-regulated with progression to the lethal castration resistant prostate cancer (CRPC) and has recently been shown to be associated with Gleason scoring, a well-established pathohistological classification system of prognostic value for prostate cancer. Additionally, SR-BI has been linked to the mTOR pathway, which plays a key role in the regulation of cellular growth and metabolism and has further been associated with CRPC. Hence, SR-BI may be a valuable target for prostate cancer therapy, a prospect that needs evaluation in future studies.