Addition of hormones to non-metastatic prostate cancer and its effect on myosin IC expression

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Abstract:
Myosin IC is member of a superfamily of cellular motor proteins that, together with the cytoskeletal element, actin filaments, facilitates many different types of cellular movement and intercellular transport. The myosin IC gene expresses three different isoforms including myosin IC isoform A, B, C. Expression of myosin IC isoform A was found to be elevated specifically in metastatic prostate cancer cells of both mouse and human origin when compared to non-cancer prostate cells and when compared to other (non-prostate cancer) cancer cells from other tissues. The addition of select hormones to a non-metastatic prostate cancer is able to induce an expression of myosin IC isoform A. LNCaP, a non-metastatic prostate cancer cell line, were exposed to the hormone, dihydrotestosterone (DHT). These prostate cancer cells then had their relative expression of myosin IC isoform A and B tested and compared to control cells.

The most common cancer diagnosis for men is prostate cancer (Baade et al., 2009). Often times, prostate cancer will develop into a metastatic or aggressive form that will become lethal. Currently, there is no dependable method or marker known for the early detection of prostate cancer. The myosin IC gene expresses three different isoforms that are named myosin IC isoforms A, B, and C. Isoforms A and B contain additional unique amino acids when compared to isoform C that allow them to localize to the nucleus (Ihnatovych et al., 2012).

Expression analysis of the myosin IC isoforms in mouse tissues showed that of the three isoforms specifically isoform A, is present in only a few tissues while myosin IC isoform B is relatively equally present in all the tissues tested (Sielski et al., 2014). Importantly, expression of myosin IC isoform A was found to be elevated specifically in metastatic prostate cancer cells of both mouse and human origin when compared to non-cancer prostate cells and when compared to other (non-prostate cancer) cancer cells from other tissues. This suggests that this specific protein may be used as a biomarker that would allow for testing for prostate cancer (Ihnatovych et al., 2014). However, the reason for elevation of expression is not known.

References:

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