ABSTRACT

The Culture and Propagation of a Novel Jamaican Prostate Cancer Cell Line.

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Prostate Cancer (PCa) disparately affects Males of African Ancestry (MAA) greater than Males of European Ancestry (MEA). Understanding PCa in MAA and the development of targeted treatment options is limited due to insufficient research models from MAA. This research focuses on the development of one such model; a Jamaican PCa cell line, derived from a MAA, the first cell line from the Caribbean and one of three PCa cell lines from MAA worldwide. Of the 28 PCa samples collected for this research, 13 extended explants were generated while protocols were optimized for the establishment of future PCa explants. PCa extended explants were susceptible to senescence and as such we attempted to delay senescence through conditional reprograming using y27632 (Rock inhibitor) with 3T3 swiss albino feeder cells. We also attempted immortalization procedures through transduction with plV-hTERT-puro and dual transduction with pLV-hTERT-IRES-hygro and lentiCRISPRv2-sg*CDKN2A.* Successful immortalization was realized with sample ACRJ-PC28. ACRJ-PC28 represents a transitional cell line, as cells are positive for both CK5 and p63, basal markers of cancer as well as CK18, a luminal marker of cancer. ACRJ-PC28 was negative for Androgen Receptor (AR) expression, despite attempts to induce expression with DHT supplementation and Epidermal growth factor (EGF) starvation. However, WGS revealed the presence of the AR gene with two intronic SNPs; rs757091151 and rs2207040, possibly contributing to the non-expression of AR protein. A soft agar assay of ACRJ-PC28 indicated that cells could form spheroids in anchorage-independent medium, an indicator of potential tumor forming capacity in animal models. Cytotoxicity screening of a *Cannabis sativa* THC extract against ACRJ-PC28 and PC-3, indicated that the extract was 9.47 times more potent in reducing the viability of ACRJ-PC28 than PC-3 (IC_{50} of 0.0011975 mg/ml and 0.011345 mg/ml respectively). The establishment of ACRJ-PC28 presents an opportunity for continued research in understanding prostate cancer in MAA.

Keywords: males of African ancestry; prostate cancer; epithelial cell culture; Jamaican cell line.