Anti-Androgen Therapeutic Agents: Use of PTLC and Microplate Counting to Measure Isolates From Four Promising California Indigenous Plants on Anti-Proliferation in LNCaP, DU145, PC-3, and 22Rv1 Prostate Cancer Cell Models

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Better therapeutics for prostate cancer are needed as over 34,000 American men are estimated to die of prostate cancer in 2023. Natural products have been valuable sources of anticancer agents as 41% of new anticancer drugs approved by the FDA are natural products and their derivatives. As such, using indigenous plants native to Central California are tested to identify possible unique chemical scaffolds for anti-androgen therapeutic agents for resistant prostate cancer. Previously, preliminary WST-1 bioassay results showed four indigenous plants to be most promising with anti-proliferative properties: Spotted spurge, Johnson Grass, Fleabane, and Yellow Nutsedge. In phase one, the four indigenous plants are extracted and concentrated into organic extracts. For phase two, the four organic extracts were subjected to plate thin-layer chromatography (PTLC) to be isolated. Phase three involved running a WST-1 bioassay on the isolates of the four plants. Phase four required the results of phase three and further PTLC isolation. Phase five evaluated WST-1 bioassay of isolates from phase four. Phase six took the most promising subfraction and ran an NMR Spectrum. Spotted Spurge(Fragment 5) and its subfractions 1,2,3,7 were the most promising on cell models with androgen receptors. Additionally, the NMR spectra suggest that the isolates are terpenoids. Similar to other structures found in anti-cancer drugs. This study shows that indigenous plants native to Central California can be possibly used as anti-androgen therapeutic agents for resistant prostate cancer. Further research involves further determining and investigating mechanisms of chemical structures.

Awards Won:
Fourth Award of $500