PHOSPHOPROTEINS AND SIGNAL PATHWAYS OF HUMAN PROSTATE CANCER AND TRIPLE-NEGATIVE BREAST CANCER

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Understanding the signal transduction pathways is essential for the identification of new therapeutic targets for the treatment of cancer. We reported the characterization of the phosphoproteome of androgen-repressed human prostate cancer (ARCaP) cells and human triple-negative breast cancer (TNBC) tissue samples. We detected phosphoproteins with a modified hybrid linear quadrupole ion trap/Fourier Transform Ion Cyclotron Resonance (FT-ICR) mass spectrometer and identification of potential therapeutic targets through bioinformatics and statistical analysis. With ultrahigh mass accuracy and stringent filtering, we identified 385 phosphoproteins with high confidence and 63 signaling transduction pathways in ARCaP, including mammalian target of rapamycin (mTOR) pathway and E2F signaling pathway. Phosphorylated retinoblastoma-1 protein (RB1) was also detected. The detection of phosphorylated androgen-induced proliferation inhibitor (APRIN) leads to the hypothesis that APRIN activity in ARCaP cells is responsible for an androgen-repressed phenotype. Phosphoproteomics results of TNBC tissue samples obtained from an African American woman will also be discussed.