Inhibition of BCKDK to increase the sensitivity of breast cancer cells to paclitaxel

Background: Breast cancer is the most diagnosed cancer among women worldwide. Drug resistance is the major challenge in breast cancer management. Paclitaxel, a first-line chemotherapeutic drug for certain types of breast cancer, often develops resistance with time. Our group has identified the genes that contribute to paclitaxel resistance. One of these genes was BCKDK (branched chain alpha keto acid dehydrogenase kinase). Inhibition of BCKDK with siRNA or drugs increases the sensitivity of breast cancer cell lines to paclitaxel. The development of BCKDK inhibitors for clinical use may help to overcome drug resistance and lead to improved patient survival rates. **Methods**: EBSS was supplemented with BCAA to obtain a media equivalent to DMEM with a range of BCAA concentrations. The effect of growing the cells in different media and measuring the level of IC50 of paclitaxel was tested. **Results**: showed the effectiveness of our method in the manipulation of intracellular BCAA and emerged the difference in breast cancer cell growth corresponds to the cell culture BCAA level. Also, the lower level of BCAA in the cells growing media is causing the cells to be more sensitive to paclitaxel.