Berberine Compounds as a Potential Methodology for Controlling Activity of Select Membrane Proteins

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Chemotherapy is currently the number one remedy for cancer. The side effects are significant and lead to various problems such as hair loss. Recently research has shown that compounds such as berberine controls the growth of cancer cells, causes tumor cell apoptosis, inhibits blood vessel growth to tumors, and inhibits the cancer cells to resist drugs over time. It was hypothesized that there would be reduction of the activity of the AKT protein when the BBR (berberine) compounds Oregon grape, Goldenseal, and Barberry are applied to the cell line (PC-12, ATCC #CRL-1721). An ICC process was used to target the AKT protein. For the BBR to be tested, 28 milliliters of Barberry were added, and 14 milliliters of Oregon Grape and Goldenseal were added to the appropriate wells with the cells. These were placed back in the incubator and allowed to grow for 24 hours. The AKT1 antibody was added to theses mixtures. After incubation, an ABC mouse staining system was used to indicate AKT1 inrteraction .The cells were observed under a microscope and analyzed with a density slice to determine the AKT expression. The alkaloid berberine compounds proved to have a positive impact when targeting the AKT (Protein Kinase B/PKB) pathway in the cells. It was significantly reduced in the cells by extracts of Barberry, Oregon Grape, and Golden Seal, all which contain the compound berberine. The presence of AKT in the control showed an average of 113 expressions. Barberry showed 22.8 AKT expressions, Goldenseal 30 expressions, and Oregon Grape 22.5 expressions. The reduction for Barberrry was 80%, Goldenseal 73%, and Oregon grape 81%. Without the essential AKT signaling, the reduced pathway activity caused by berberine compounds could be a plausible treatment for cancer and related diseases.

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