To What Extent Does the L Form of Beta-Hydroxybutyrate (BHB) Have Unique Anti-Cancer Effects Compared to the D Form, on U87 Brain Cancer Cells in vitro?

Shirley, Cheyenne (School: South Sumter High School)

The purpose of this experiment was to identify if the L form of beta-hydroxybutyrate has unique anticancer effects compared to the D form, on the proliferation of cancer cells. It was hypothesized that if the D-BHB and L-BHB form was applied to the U87 brain cancer cells at a concentration of 1mM, 2mM, 5mM, and 10mM, then the L-BHB form would most effectively slow the proliferation of the U87 brain cancer cells because it is the conserved form of beta-hydroxybutyrate. The initial step in experimentation was to calculate cancer cell concentrations to find the volume of solution needed to place 50,000 cells in each of 33 wells. Each well plate was treated with the corresponding L-BHB and D-BHB at concentrations of 1mM, 2mM, 5mM, and 10mM as well as 3 controls per plate of media only. All cells were counted and analyzed after incubating for 2 days. The researcher found that after a 48 period, the average live count showed that the D-BHB form has lower proliferation rates than the L-BHB form. Through this research, the data indicates that a D-BHB concentration of 5mM provides the most effective decrease in cancer cell proliferation.

Awards Won: