Exploring Alzheimer's Prevention

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Curcumin is a derivative of the Indian spice turmeric known for chelating properties. In Alzheimer’s Disease, free metal ions in the brain play a major role in protein degradation and plaque aggregation. Curcumin could possibly chelate free metal ions rendering them incapable of fulfilling their role in the disease. In order to test the effectiveness of metal ion chelation by curcumin the metal ions Fe II, Mn II, and Zn were added to a buffer and curcumin solution that mimics the pH of human blood which is 7.35 and they were also added to a distilled water and curcumin solution with the pH of 5.00 in order to compare the chelation of metal ions by curcumin in different pH levels. The hypothesis was that curcumin would chelate the specified metal ions more effectively at the more basic solution of pH at 7.35 rather than the more acidic solution of pH at 5.00. The procedure involved measuring a specific amount of metal ions into their own vials with buffer or water. The metal ions were each added to their own vial of both buffer and water. They were measured by a UV-VIS spectrophotometer to find the concentration of the free metal ions. Curcumin was added to each vial and agitated to mix. A second measurement was taken to find the new concentration of free metal ions and of the forming curcumin-metal complex for each vial. It was found that after the addition of curcumin each test case had a significantly lower concentration of free metal ions suspended in solution and the curcumin-metal complexes increased in concentration. The findings are hopeful in the possible use of curcumin as a preventative agent in Alzheimer’s Disease. However research must persist in order to better understand the disease and its prevention.

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