Poster Presentation

Chemical Modification of Lipoic Acid

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Alpha-lipoic acid (ALA) was first isolated in 1951 and since then it has been the subject of many research studies. ALA is an antioxidant found in certain foods, including red meat, spinach, broccoli, potatoes, yams, carrots, beets, and yeast. It is also made in small amounts in the human body, where it helps turn glucose into energy. The goal of this project is to synthesize novel derivatives of lipoic acid by doing chemical modification on ALA and to study the activities of the synthetic products.

Several derivatives of lipoic acid were designed based on the previous experimental evidence and literature data. The synthesis of the derivatives of lipoic acid will be described. Glutathione peroxidase (Gpx) activity will be measured to evaluate the antioxidant capacity of the products and will be compared with that of lipoic acid. Gpx is a selenoenzyme which catalyzes the reduction of a variety of hydroperoxides and protects the cell membranes from oxidative damage. There are several methods available to determine the Gpx activity of potential antioxidants. We are going to use the UV method using aromatic thiols (thiophenol) as glutathione alternative to reduce hydrogen peroxide in the presence of catalysts which are our three products. The initial reduction rates of hydrogen peroxide will be measured and compared with that of lipoic acid itself.