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Antioxidants to combat Alzheimer's disease

Laura Phillips, Agnes Simonyi, and Grace Sun

Alzheimer's disease (AD) took the life of my grandfather. It is believed that oxidative stress contributes to the progression of this disease. Studies in Dr. Sun's laboratory recognized NADPH oxidase as possible source for production of reactive oxygen species (ROS) which can damage cells in the brain. If this were true then something could be found to stop the activation of NADPH oxidase. This would stop the deterioration of cells, decreasing the amount of Alzheimer's cases. To do my part of this research, we culture immortalized astrocytes (DITNC) and look at how cells react to menadione, a compound that produces ROS, possible through activating NADPH oxidase. We will then see how apocynin stands up against menadione. To test this we had six wells containing the astrocytes. In the first two wells we didn't add anything to the cells, these were our control cells. In the other four wells we added menadione, and then in two of those wells we added apocynin. We then took pictures right after we added the inhibitor, 30 minutes after they were in the incubator, 60 minutes, and then 120 minutes later. Doing this allowed us to see the difference in adding apocynin and not adding it. Looking at our results, we found the wells with only Menadione had more cells that were dead and shriveled up, and there were fewer dying cells in the wells containing Apocynin. This means it is possible for Apocynin to be used to stop the activation of NADPH oxidase; this would keep cells from dying.