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Researchers Study Effect of Cinnamon Compounds on Brain Cells

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ARS scientists have found that compounds in cinnamon extract (not table cinnamon) prevent isolated brain cells from swelling, which can occur in traumatic brain injury and stroke. Photo courtesy of Microsoft clipart.

(PhysOrg.com) -- Cell-culture studies looking into how compounds in cinnamon extract affect brain cells are being conducted by Agricultural Research Service (ARS) scientists. The researchers have reported findings that the compounds studied prevented isolated brain cells from swelling, one of the many abnormal conditions resulting from traumatic brain injury and stroke due to impaired blood flow to the brain.

Brain swelling is a condition in which fluid either accumulates within

brain cells or is retained in blood vessels that form around brain cells. The mechanisms underlying cell swelling in stroke are not clearly understood, but may be due in part to a membrane within brain cells not working properly.

Lead ARS author and neurobiologist Kiran Panickar worked on the research with chemists Richard Anderson and Marilyn Polansky at the ARS Beltsville Human Nutrition Research Center in Beltsville, Md.

The scientists used isolated glial cells—cells that support essential elements of neural tissue found in the brain and spinal cord—and put them in a culture solution. When the cell cultures were deprived of oxygen and glucose for five hours, the researchers measured the function of the mitochondrial inner membrane in the glial cells. They found a nearly 40 percent decline in the mitochondrial membrane potential due to the lack of oxygen and glucose.

The researchers then exposed some of the cells to a cinnamon extract, while other cells served as “nonexposed” controls. The reduction in the membrane potential was alleviated in the presence of the cinnamon extract.

Ninety minutes later, the researchers measured volume of the glial cells. They found that cell volume among the oxygen- and glucose-deprived cells had increased by more than 34 percent. But this increased swelling was absent in the presence of cinnamon polyphenol extract at the highest level tested.

Because neuroglial cell swelling can contribute to further neuronal injury, the study indicates that further animal-model research is warranted, according to the authors. The researchers caution that table cinnamon compounds may accumulate in the body and should not be ingested consistently as more than a spice over long periods of time.