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Molecular Mechanisms Underlying Neuronal Hypertrophy in Asymptomatic AD

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After an individual dies of Alzheimer's disease, autopsy of the brain reveals characteristic pathologic features such as amyloid plaques and neurofibrillary tangles. In recent years several studies, such as the Baltimore Longitudinal Study of Aging (BLSA), have found that many persons with normal brain function while alive, exhibit very similar pathologic features on brain autopsy. Scientists have termed this condition asymptomatic Alzheimer's disease. A key question in Alzheimer research is why some people are able to maintain normal brain function even when they have the pathologic features of Alzheimer's disease.

Juan C. Troncoso, M.D. and colleagues are studying brain autopsy specimens from individuals who participated in the BLSA and other studies of aging. When they examined the brains of persons who died with asymptomatic Alzheimer's disease, the researchers observed that nerve cells in some parts of the brain have enlarged cell bodies and nuclei (the central part of the cell). Dr. Troncoso's team has proposed to extend their studies to determine if these changes reflect a mechanism that may protect the nerve cells from degeneration.

The researchers first plan to confirm their results in another group of autopsy specimens from a different aging study. They will then perform more detailed studies of the nerve fibers and proteins from the brain specimens of people who died with asymptomatic Alzheimer's disease. Finally, the researchers plan to study the genes of these individuals to try to determine if specific genes may protect an individual from the declines in brain function that normally accompany the pathologic changes of Alzheimer's disease. These studies may help scientists to identify factors in the brain that counteract the detrimental effects of Alzheimer's disease.