

Gold nanoparticles, radiation combo may slow Alzheimer's

Again small amounts of radiation are beneficial.

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Chemists in Chile and Spain have identified a new approach for the possible treatment of Alzheimer's disease that they say has the potential to destroy beta-amyloid fibrils and plaque -- hypothesized to contribute to the mental decline of Alzheimer's patients. The researchers say the new technique, which they call a type of "molecular surgery," could halt or slow the disease's progress without harming healthy brain cells. The research is scheduled for publication in the Jan. 11 issue of the American Chemical Society's Nano Letters.

Using test tube studies, the scientists attached gold nanoparticles to a group of beta amyloid fibrils, incubated the resulting mixture for several days and then exposed it to weak microwave fields for several hours. The energy levels of the fields were six times smaller than that of conventional cell phones and unlikely to harm healthy cells, the researchers say. The fibrils subsequently dissolved and remained dissolved for at least one week after being irradiated, indicating that the treatment was not only effective at breaking up the fibrils but also resulted in a lower tendency of the proteins to re-aggregate, according to the researchers.

The same approach also holds promise for treating other neurodegenerative diseases that involve protein aggregation, including Parkinson's and Huntington's, says study leader Marcelo J. Kogan, of the University of Chile in Santiago. He says that the approach is similar to that of another experimental technique that uses metallic nanoparticles to label and destroy cancer cells. Animal studies are planned, Kogan says.

There's currently no cure for Alzheimer's disease and no one is sure of its exact causes. The disease affects an estimated 4.5 million people in the United States, according to the National Institute on Aging. That figure is expected to rise dramatically as the population ages, experts predict.

The American Chemical Society — the world's largest scientific society — is a nonprofit organization chartered by the U.S. Congress and a global leader in providing access to chemistry-related research through its multiple databases, peer-reviewed journals and scientific conferences. Its main offices are in Washington, D.C., and Columbus, Ohio.