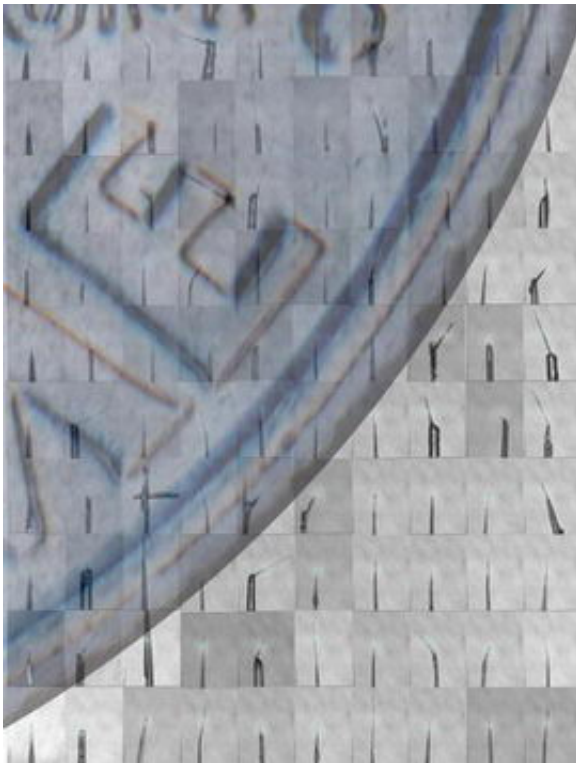


Alzheimer's, Parkinson's, type 2 diabetes similar at molecular level

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A montage of micro-crystals is used to determine the microscopic structures of Alzheimer's, other diseases, with the image of a U.S. dime superimposed. Credit: UCLA

Alzheimer's disease, Parkinson's disease, type 2 diabetes, the human version of mad cow disease, and other degenerative diseases are more closely related at the molecular level than scientists realized, a team reports this week in an advanced online publication of the journal

Nature.

While still preliminary, the research, could help scientists develop tools for diagnosing such diseases, and potentially for treating them through "structure-based drug design," said David Eisenberg, a UCLA chemist and molecular biologist who is part of the research team.

The researchers studied the harmful rope-like structures known as amyloid fibrils--linked protein molecules that form in the brain. The fibrils contain a stack of water-tight "molecular zippers."

"With each disease, a different protein transforms into amyloid fibrils, but all of these diseases are similar at the molecular level," Eisenberg said.

If the molecular zipper is universal in amyloid fibrils, as Eisenberg believes, is it possible to pry open the zipper or prevent its formation?

Eisenberg's research team used X-ray analysis and a sophisticated computer algorithm to study proteins known to be associated with human diseases. When the computer said a protein will form an amyloid fibril, it almost always did. And one team member is experimenting with various compounds to break up the fibrils.

"Structural analysis of micro-crystals of proteins is an example of how basic research can have a profound impact on our understanding of health, biotechnology and other practical issues," said Parag Chitnis, program director in National Science Foundation's (NSF) Division of Molecular and Cellular Biosciences.

Source: National Science Foundation

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