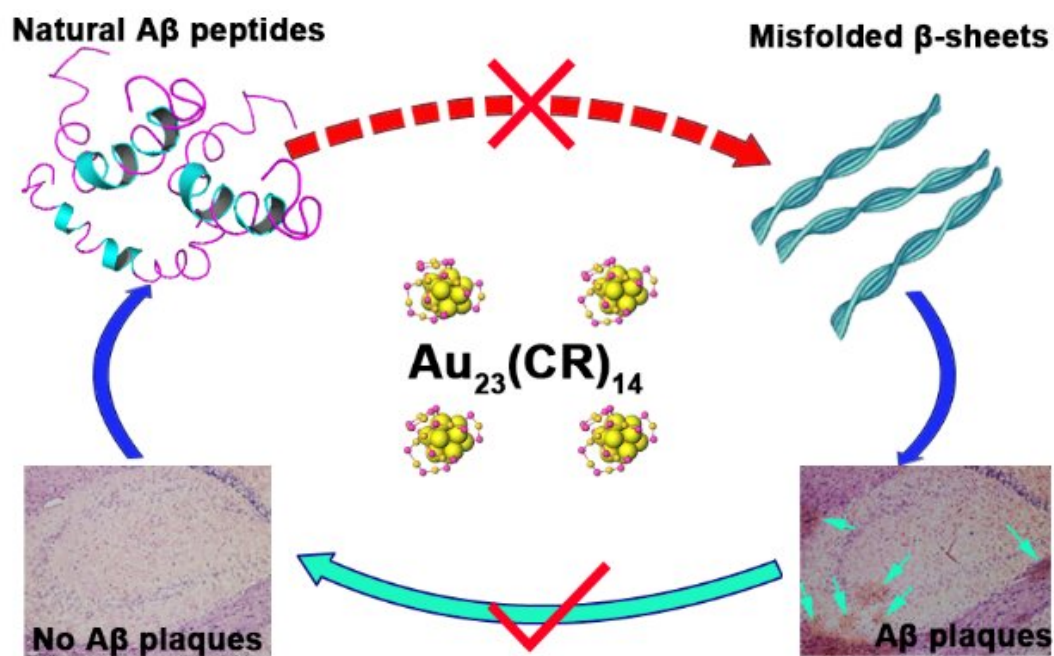


Gold nanoclusters: New frontier for developing medication for treatment of Alzheimer's disease

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$Au_{23}(CR)_{14}$ Nanocluster functions in multiple stages of the progression from $A\beta$ monomer to $A\beta$ plaques. Credit: ©Science China Press

Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by amyloid- β ($A\beta$) fibrillation and plaque formation. While more than 50 million people are devastated by AD, no treatment is available. Recently, anti- $A\beta$ antibody-based immunotherapy has failed

in clinical trials, partially due to the increased cytotoxicity of soluble A β oligomers. Therefore, developing a medication for AD treatment becomes an even more important challenge.

In a new research article published in the Beijing-based *National Science Review*, scientists at the State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology in China explored the possibility of treatment with gold nanoclusters.

Au₂₃(CR)₁₄, a novel gold nanocluster modified with Cys-Arg (CR) dipeptide, functions in multiple stages of the progression from A β monomer to A β plaques. It inhibits the misfolding and fibrillation of amyloid- β (A β), fully dissolving the preformed/mature A β fibrils and restoring the conformation of A β peptides from misfolded β -sheets into unfolded monomer state with abolished cytotoxicity, and more importantly, completely dissolving endogenous A β plaques in the brain slices from transgenic AD model mice. Furthermore, Au₂₃(CR)₁₄ has good biocompatibility and infiltration ability across the blood brain barrier (BBB).

This article not only presents a compelling nanotherapeutic candidate for AD treatment, but also opens a new frontier for developing nanomaterial-based medications for AD treatment. Undoubtedly, more researches studying the basic mechanisms by which [gold nanoclusters](#) dissolve A β plaques will spur the development of new medications for AD treatment.

More information: Wenkang Zhang et al, Au₂₃(CR)₁₄ Nanocluster restores fibril A β 's Unfolded state with abolished cytotoxicity and dissolves endogenous A β Plaques, *National Science Review* (2019). [DOI: 10.1093/nsr/nwz215](https://doi.org/10.1093/nsr/nwz215)

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