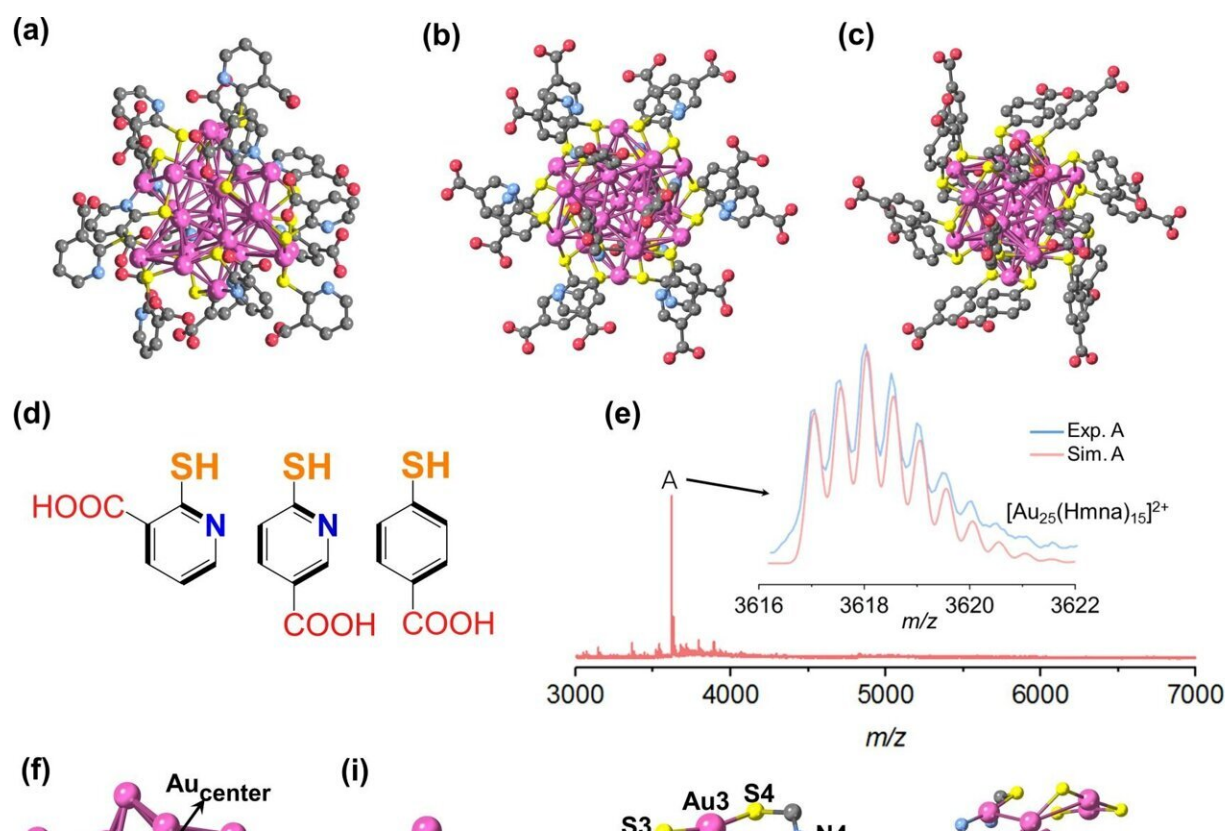


Biomimetic crystallization for long-pursued $-\text{COOH}$ -functionalized gold nanocluster with near-infrared phosphorescence

November 28 2023



The total structures of Au₂₅a (a), Au₂₅b (b) and Au₂₅c (c). (d) Molecular structures of 2-H₂mna, 6-H₂mna and *p*-MBAH. (e) ESI-MS of Au₂₅a dissolved in H₂O/MeCN. Inset: the experimental (blue trace) and calculated (red trace) isotopic patterns of the molecular ion peak [Au₂₅(Hmna)₁₅]²⁺. The Au₂₅ frameworks in Au₂₅a (f), Au₂₅b (g) and Au₂₅c (h). Anatomy of the crystal structures in Au₂₅a (i), Au₂₅b (j) and Au₂₅c (k). Color codes: Purple, Au;

yellow, S; blue, N; gray, C. All hydrogen atoms, and some carbon tails of thiolate ligands are omitted for clarity. Credit: Science China Press

Recently, Professor Di Sun's group at Shandong University extended the salting-out method (commonly used to crystallize biological macromolecules, proteins, and DNA) to crystallize –COOH-functionalized AuNCs and obtained high-quality single crystals of three novel –COOH-functionalized Au₂₅ nanoclusters, revealing the crystallographic structure of long-pursued –COOH-functionalized AuNCs.

This study not only demonstrates a facile approach for crystallizing –COOH-functionalized AuNCs, but also breaks the traditional perception of the structure of Au₂₅(SR)₁₈ and paves the way for investigating the correlation between their structures and properties.

"These new exciting results may be helpful for crystallizing protein-protected AuNCs, which have gained considerable attention in chemosensing or biosensing of cancer biomarkers, neurotransmitters, [pathogenic microorganisms](#), biomolecules, pharmaceutical compounds, and immunoassays. This work will attract broad interest from the multi-disciplinary fields, including chemistry, biology, and materials," Di Sun says.

The study is [published](#) in the journal *Science Bulletin*.

More information: Wei-Dong Tian et al, Biomimetic crystallization for long-pursued –COOH-functionalized gold nanocluster with near-infrared phosphorescence, *Science Bulletin* (2023). [DOI: 10.1016/j.scib.2023.11.014](#)

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