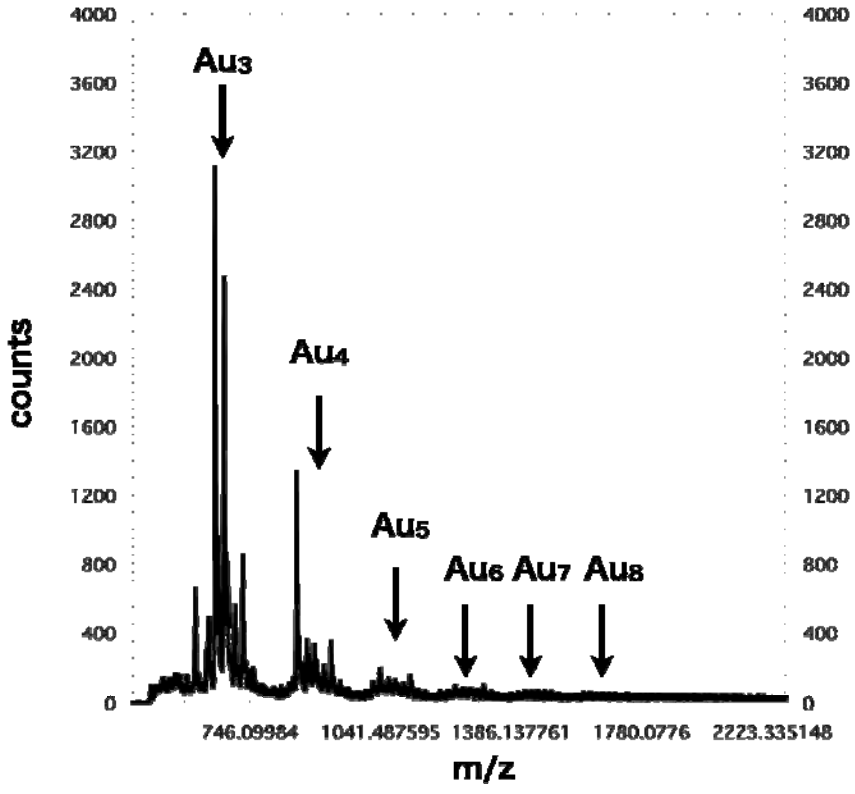
Supporting information S1

Experimental:

Mass spectrum of Au NC was measured by using MALDI-TOF MS, Applied Biosystems, Voyger System 4379, USA oparated by N2 laser (337nm, 20.0Hz, acceraration voltage=20kV) in the linear configuration. Single drop (aprox. 1µL) of methanol solution of 2,5-dihydroxybenzoic acid were dropped onto the sample plate, and then, dried at room temperature. One microlitter of toluene solution of Au NC and PB-NH2 was also dropped over the matrix region, and dried. After dry, mass spectrum was measured by using the positive mode of mass spectroscopy. In the case of 2-(4-hydroxyphenylazo)benzoic acid (HABA) matrix, a toluene solution of Au NC and **1** and the methanol solution of HABA were mixed, and then, the mixed solution was also dropped on a sample plate and the mass spectrometry was performed according to the above mentioned procedures.

Result:

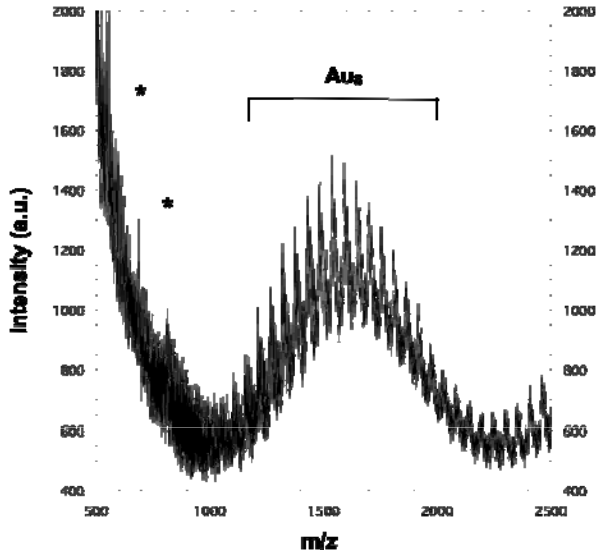
(i) MALDI-TOF MS spectrum of Au NC (matrix: 2,5-dihydroxybenzoic acid)



Multipule peaks attributed to the fragmentation of Au nanoclusters were observed. The maximum mass was observed at 1600 m/z. Atomic weight of Au is 196.96, thus, molecular weight of Au_8 cluster is 1575.68. there are intermitted broad peaks exist every 200 m/z, these are considered as fragmented Au nanoclusters shown in the plot. Broadning of mass spectum was occurred due to ionization of Au clusters with other atoms including clorinea This result suggest that formation of Au

nanoclusters.

(ii) MALDI-TOF MS spectrum of Au NC (matrix: HABA)

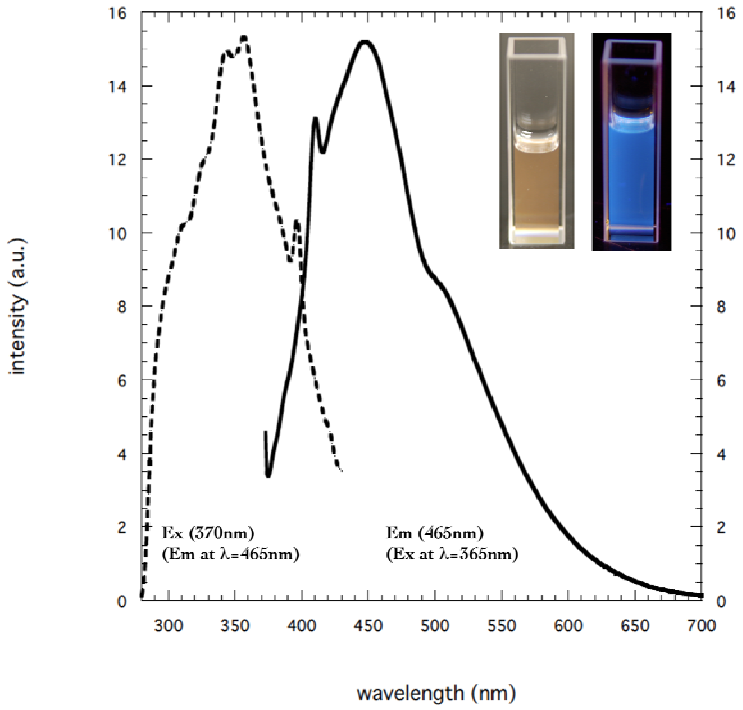


More detail spectrum of Au_8 cluster was obtained when HABA was used as a matrix. Clear peaks around 1580 m/z are identical to the Au_8 clusters. The * marks indicate the dimer and trimer of HABA.

Supporting information S2

Emission and excitation spectra of Au NC with **2**

Result:



Basically same emission and excitation peaks from Au NC were observed at λ=465nm and 370nm, respectively. The inset photographs show the toluene solutions of Au NCs under visible light (left) and UV light (λ=365nm), respectively.