Supplementary Information

The controllable synthesis of orange-red emissive Au nanoclusters
and used as portable colorimetric fluorometric probe for
dopamine

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1. Optimum reaction conditions were optimized

Fig. S1 The experiment of optimization of reaction concentrations of NaOH (0.3-0.6 M)

Fig S2 The experiment of optimization of reaction time (6-30 hours)

Fig. S3 The experiment of optimization of reaction temperature (35-50 °C)
2. Comparison of transmission microscope images before and after DA to M-AuNCs

Fig. S4 TEM contrast of dopamine in M-AuNCs (a)TEM of M-AuNCs, (b)TEM of M-AuNCs+DA
3. Cellular imaging and MTT assay

The MTT test was carried out by using a microplate reader (Synergy HT, BioTek Instruments Inc., USA). To evaluate the cytotoxicity of the M-AuNCs, the viability of the U14 cells was assessed by measuring their ATP activity after exposure to the M-AuNCs. 100 µL of the cell suspensions in cell media at a concentration of $10^4$ cells/mL were seeded in 96-well plates and allowed to attach overnight. After removal of the cell media, the wells were washed twice with PBS buffer (pH=7.4) and then 100 µL of the tested M-AuNCs at the relevant concentrations were added. After incubation, the reagent was added to each well to assess the ATP activity.

![Cell Viabilities of U14 cells after incubation with M-AuNCs for 24 h by MTT assay.](image)

**Fig. S5.** Cell viabilities of U14 cells after incubation with M-AuNCs for 24 h by MTT assay.

Cellular imaging

After the U14 cells with M-AuNCs incubated for 4 h, majority cells showed light red light emission, indicated that the M-AuNCs were successfully absorbed by endocytosis. These results depicted that the prepared non-toxic and great biocompatibility pink fluorescent emission M-AuNCs could be excellently applied to the biological imaging.
4. Recovery of DA in serum

Table S1 Recovery of DA in serum

<table>
<thead>
<tr>
<th>Sample</th>
<th>Added (μM)</th>
<th>Total Found (μM)</th>
<th>Recovery (%)</th>
<th>RSD (%), n=5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0</td>
<td>0.995</td>
<td>99.5</td>
<td>2.5</td>
</tr>
<tr>
<td>serum</td>
<td>0.6</td>
<td>0.611</td>
<td>101.8</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>0.203</td>
<td>101.5</td>
<td>1.6</td>
</tr>
</tbody>
</table>

5. The QY of the M-AuNCs

The QY of the M-AuNCs was obtained through reported methods.[1] The related data were measured under the same excitation wavelength and slit bandwidths. The formula is as follows.

\[
Q_{\text{AuNCs}} = Q_R \left( \frac{I_{\text{AuNCs}}}{I_R} \right) \left( \frac{A_R}{A_{\text{AuNCs}}} \right) \left( \frac{\eta_{\text{AuNCs}}^2}{\eta_R^2} \right)
\]

where QY is the quantum yield of M-AuNCs, I refers to the integral area under FL spectra, \( \eta \) represents the refractive index of solvent, A refers to the UV-vis absorbance under the excitation wavelength. R is the reference (quinine sulfate).