Electronic Supplementary Information (ESI) for New Journal of Chemistry.

Supporting Information for

Design of a β-diketonate–Eu³⁺ complex-based time-gated luminescence probe for visualizing mitochondrial singlet oxygen

Jing Wu,*a Yue Xing,a Huan Wang,a Hongjing Liu,a Mei Yanga and Jingli Yuanb

a School of Chemistry and Chemical Engineering, Liaoning Normal University, Dalian 116029, P. R. China. b State Key Laboratory of Fine Chemicals, School of Chemistry, Dalian University of Technology, Dalian 116024, P. R. China.

*Corresponding authors. Tel: +86-411-82158329
E-mail: wujing@lnnu.edu.cn
Fig. S1 $^1$H NMR spectrum of ATPY.
Fig. S2 ESI-mass spectrum of ATPY.
Fig. S3 ESI-mass spectrum of Eu(DHH)$_3$(ATPY).
Fig. S4 Job’s plot of the reaction between Eu$^{3+}$ and DHH in 0.05 M borate buffer of pH 7.4 (the total concentration of Eu$^{3+}$ and DHH was kept at 10 µM).
Fig. S5 Job's plot of the reaction between Eu(DHH)$_3$ and ATPY in 0.05 M borate buffer of pH 7.4 (the total concentration of Eu(DHH)$_3$ and ATPY was kept at 2 µM).
Fig. S6 ESI-mass spectrum of Eu(DHH)$_3$(EP-ATPY).
Fig. S7 Effects of pH on the luminescence lifetimes of Eu(DHH)$_3$(ATPY) (1 μM, black line) and Eu(DHH)$_3$(EP-ATPY) (1 μM, red line) in 0.05 M borate buffer.
Fig. S8 Viabilities of the HepG2 cells after incubating with different concentrations of Eu(DHH)$_3$(ATPY) for 24 h.
**Table S1** Luminescence properties of Eu(DHH)$_3$(ATPY) and Eu(DHH)$_3$(EP-ATPY) in 0.05 M borate buffer of pH 7.4

<table>
<thead>
<tr>
<th>Complex</th>
<th>$\lambda_{\text{ex, max}}$ (nm)</th>
<th>$\varepsilon_{334 \text{ nm}}$ (cm$^{-1}$ M$^{-1}$)</th>
<th>$\lambda_{\text{em, max}}$ (nm)</th>
<th>$\Phi$ (%)</th>
<th>$\tau$ (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eu(DHH)$_3$(ATPY)</td>
<td>334</td>
<td>6.4x10$^4$</td>
<td>610</td>
<td>17</td>
<td>0.41</td>
</tr>
<tr>
<td>Eu(DHH)$_3$(EP-ATPY)</td>
<td>334</td>
<td>9.6x10$^4$</td>
<td>610</td>
<td>53</td>
<td>0.63</td>
</tr>
</tbody>
</table>