Supporting Information for

A novel chromo- and fluorogenic dual sensor for Mg\(^{2+}\) and Zn\(^{2+}\) with cell imaging possibilities and DFT studies†.

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$^{13}$C NMR of the ligand DFC-8-AQ in DMSO-$d_6$. 

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Table S1. $^1$H-NMR chemical shifts in ppm of selected H-atoms in CD$_3$CN.

<table>
<thead>
<tr>
<th>Compound</th>
<th>CH=O(b)</th>
<th>CH=N(c)</th>
<th>f</th>
<th>g</th>
<th>OH</th>
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<td>DFC-8-AQ</td>
<td>10.53</td>
<td>9.003</td>
<td>8.95</td>
<td>8.33</td>
<td>15.39( b)</td>
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<td>DFC-8-AQ -Zn$^{2+}$ (1)</td>
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<td>9.15</td>
<td>8.94</td>
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<td>DFC-8-AQ -Mg$^{2+}$ (2)</td>
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<td>9.57</td>
<td>9.19</td>
<td>8.74</td>
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</table>

19. Calculation of the detection limit (LOD):

The detection limit DL of **DFC-8-AQ** for M$^{2+}$ (M = Mg and Zn) was determined from $3\sigma$ method by following equation: 

$$DL = K \times \frac{S_{b1}}{S}$$

Where $K = 2$ or 3 (we take 3 in this case); S$_{b1}$ is the standard deviation of the blank solution; S is the slope of the calibration curve obtained from Linear dynamic plot of FI vs. [M$^{2+}$].

![Figure S9a](image_url). Determination of S$_{b1}$ or the blank, DFC-8-AQ solution.
Figure S9b. Linear dynamic plot of FI at 526 nm vs. [Mg$^{2+}$] for the determination of S (slope); [DFC-8-AQ] =20 µM

$$\text{LOD (Mg}^{2+}\text{)} = \frac{(3 \times 0.011)}{1.615 \times 10^7} = 2.04 \text{ nM}$$
Figure S9c. Linear dynamic plot of FI at 539 nm vs. [Zn\(^{2+}\)] for the determination of S (slope); [DFC-8-AQ] =20 µM

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\text{LOD (Zn}^{2+}\text{)} = \frac{(3 \times 0.011)}{5.68 \times 10^6} = 5.81 \text{ nM}
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