Cell-surface-anchored ratiometric DNA nanoswitch for extracellular ATP imaging

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### Table S1. Sequences of DNA nanoswitches

<table>
<thead>
<tr>
<th>Name</th>
<th>Sequences (5'-3')</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1</td>
<td>(\text{Cy3-TTATAGGATCCTGCGGTCGGAGGCACCAGGCGTAAAA} \</td>
</tr>
<tr>
<td></td>
<td>(\text{TGTA-Cy5})</td>
</tr>
<tr>
<td>O2</td>
<td>(\text{CCGACCGCAGGATCCTATAACCTGGGGGAGTAT})</td>
</tr>
<tr>
<td>O3</td>
<td>(\text{TGGGAGGAAGGGTTACATTCTACGCTGCTGTGCTTTTTTTT} \</td>
</tr>
<tr>
<td></td>
<td>(\text{TTTTTTTT-Cholesterol})</td>
</tr>
<tr>
<td>O3'</td>
<td>(\text{TGGGAGGAAGGGTTACATTCTACGCTGCTGTGCC})</td>
</tr>
<tr>
<td>Complementary DNA</td>
<td>(\text{ATACTCCCCAGGTACCTCTCCGCA})</td>
</tr>
</tbody>
</table>
Figure S1. CD spectra of the DNA nanoswitches with and without ATP.
Figure S2. Specificity of DNA nanoswitch for ATP analogues at the concentration of 500 μM.
Figure S3. Flow cytometry of A549 cells (left) and cells after incubation with the DNA nanoswitch with cholesterol (right). X-axis represents the fluorescence intensity from the APC channel.
Figure S4. Fluorescent and cell imaging experiments for studying the distribution of the sensor on the membrane using a quencher to quench the fluorescence outside the cells. (A). Fluorescence experiment. (B). Cellular experiment. (a). Cell imaging without Cu$^{2+}$. (b). Cell imaging when Cu$^{2+}$ was added immediately. The scale bar is 20 µm.
Figure S5. (A). Plot of the emission intensity ratio ($F_{A}/F_{D}$) of the A549 cells modified with FRET nanoswitch vs extracellular ATP. (B). Quantitative fluorescent intensity data in Figure 5. These data were quantified using the ImageJ software.
Figure S6. Intracellular specificity of the FRET DNA nanoswitch (500 mM ATP, CTP, GTP, or UTP). The scale bar is 20 μm.
Figure S7. Real-time monitoring of cells in order to study the process of probe detection. The scale bar is 20 µm.
Figure S8. Fluorescence imaging of different types of cells incubated with the DNA nanoswitch (fluorescence spectra were collected in the range of 570-620 nm and 655-760 nm with a 530 nm excitation wavelength, the scale bar is 20 μm).