Microwave-assisted Preparation of Paramagnetic Zwitterionic Amphiphilic Copolymer Hybrid Molybdenum Disulfide for T$_1$-weighted Magnetic Resonance Imaging-guided Photothermal Therapy

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Figure S1. TEM image of PZAC.

Figure S2. XPS survey spectrum of MoS$_2$@PZAC.
Table S1. Element content of MoS$_2$@PZAC.

<table>
<thead>
<tr>
<th>Element</th>
<th>Atoms / %</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>57.53</td>
</tr>
<tr>
<td>N</td>
<td>3.83</td>
</tr>
<tr>
<td>O</td>
<td>22.03</td>
</tr>
<tr>
<td>F</td>
<td>3.55</td>
</tr>
<tr>
<td>Mo</td>
<td>3.98</td>
</tr>
<tr>
<td>S</td>
<td>8.56</td>
</tr>
<tr>
<td>Gd</td>
<td>0.52</td>
</tr>
</tbody>
</table>

Figure S3. SEM images of (a) MoS$_2$ and (b) MoS$_2$@PZAC.

Figure S4. (a) Stability of MoS$_2$@PZAC dispersed in PBS solution. (b) Size of MoS$_2$@PZAC dispersed in serum for 7 days.
Figure S5. Infrared thermal images of water (top) and MoS$_2$@PZAC dispersion (bottom) at different time points under NIR laser irradiation (1 W/cm$^2$).

Figure S6. The temperature variations of MoS$_2$@PZAC dispersion at 100 μg/mL under irradiation with an 808 nm laser at a power density of 1 W/cm$^2$ for three on-off cycles.

Figure S7. The PTT temperature change of MoS$_2$@PZAC aqueous dispersion with a NIR laser irradiation on-off.
Figure S8. Linear time versus Lnθ obtained from the cooling period in Figure S7.

Figure S9. The $T_1$ relaxation rate of MoS$_2$@PZAC (black line) and Magnevist® (red line), obtained from the slopes of linear fits of experimental data.

Figure S10. SI of $T_1$-weighted MR signals from the tumor site at different times post-injection.
Figure S11. The temperature variations of MoS$_2$@PZAC and GNRs@BPP with the same concentration under laser irradiation (808 nm, power density of 1 W/cm$^2$).

Figure S12. The INR of MoS$_2$@PZAC with different concentration, control group was added PBS.