

# Supporting Information

## A novel high-strength photoluminescent hydrogel for tissue engineering

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**The supporting information includes,**

**Figure S1.** (a) The  $^1\text{H}$  spectrum of Eu-PVAc, (b) the  $^{13}\text{C}$  spectrum of Eu-PVAc.

**Figure S2.** (a) EDS spectrum, (b) mapping of Eu-PVAc.

**Figure S3.** The first, second, third, fourth and fifth loading stress-strain curves of (a) Sol-Eu-3 gel, (b) Fre-Eu-3 gel and (c) Exc-Eu-3 hydrogel. (d) Comparison of elastic modulus of Sol-Eu-3 gel, Fre-Eu-3 gel among the first, second, third, fourth and fifth immediate loadings.

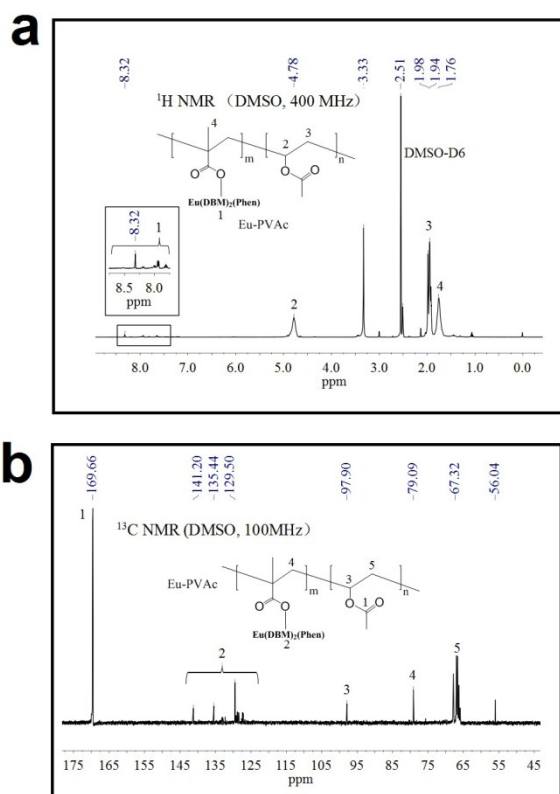
**Figure S4.** The swelling properties of the Exc-Eu hydrogels.

**Figure S5.** DSC curves and TGA curves of the Exc-Eu-hydrogels.

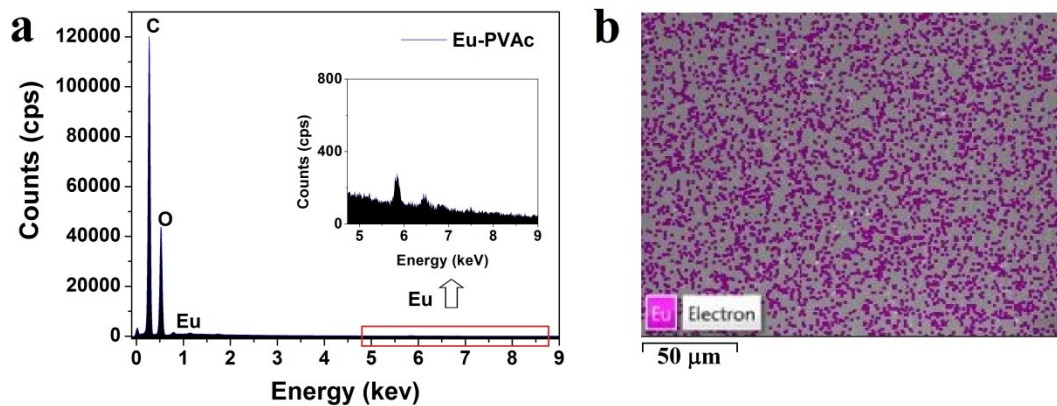
**Table S1.** Water content of the different quality Exc-Eu hydrogels.

**Movie S1.** The Exc-Eu-3 hydrogel under car pressure with 385 nm UV light.

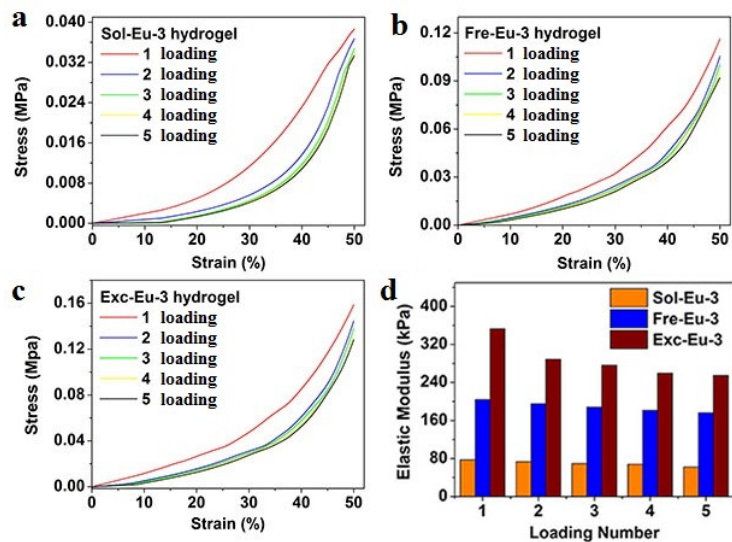
**Movie S2.** 1 kg weight was lifted up by the Exc-Eu-3 hydrogel without fracture.



**Figure S1.** (a) The <sup>1</sup>H spectrum of Eu-PVAc, (b) the <sup>13</sup>C spectrum of Eu-PVAc.



**Figure S2.** (a) EDS spectrum, (b) mapping of Eu-PVAc.



**Figure S3.** The first, second, third, fourth and fifth loading stress-strain curves of (a) Sol-Eu-3 gel, (b) Fre-Eu-3 gel and (c) Exc-Eu-3 hydrogel. (d) Comparison of elastic modulus of Sol-Eu-3 gel, Fre-Eu-3 gel and Exc-Eu-3 among the first, second, third, fourth and fifth immediate loadings.

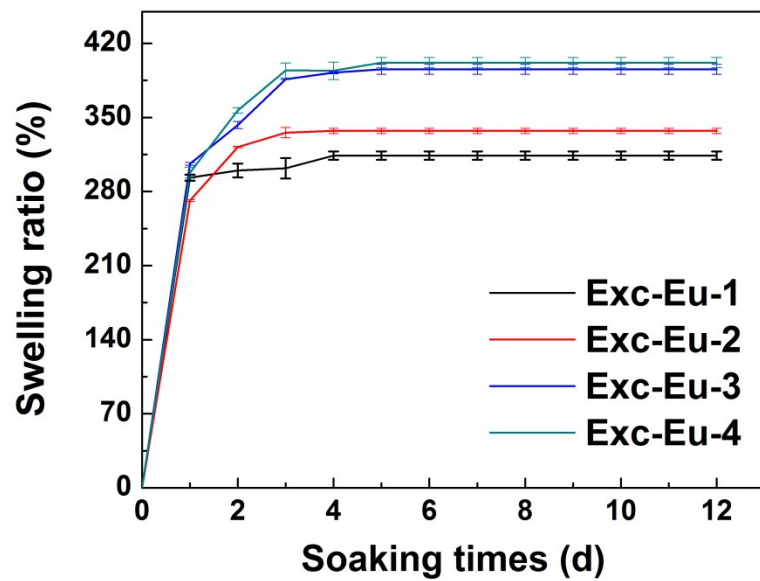
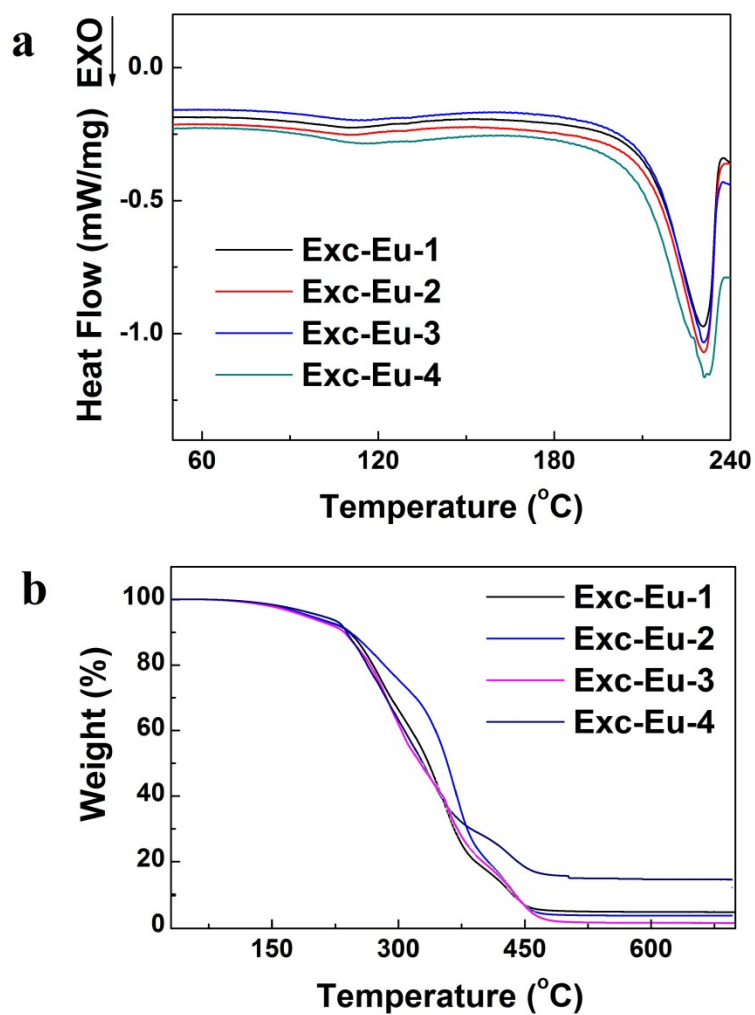


Figure S4. The swelling properties of the Exc-Eu hydrogels.



**Figure S5.** DSC curves and TGA curves of the Exc-Eu-hydrogels.

**Table S1.** Water content of the different quality Exc-Eu hydrogels.

<b>Hydrogel</b>		<b>Weight</b>					<b>Water</b>
		<b>(g)</b>					<b>content</b>
							<b>(%)</b>
<b>Exc-Eu-1</b>	<b>W<sub>0</sub></b>	2.330	2.266	2.249	2.208	2.223	90.25±0.96
	<b>W<sub>1</sub></b>	0.232	0.201	0.235	0.191	0.241	
<b>Exc-Eu-2</b>	<b>W<sub>0</sub></b>	2.242	2.254	2.232	2.261	2.254	89.01±0.57
	<b>W<sub>1</sub></b>	0.240	0.232	0.242	0.264	0.258	
<b>Exc-Eu-3</b>	<b>W<sub>0</sub></b>	2.261	2.246	2.253	2.235	2.250	88.51±1.12
	<b>W<sub>1</sub></b>	0.278	0.232	0.230	0.277	0.275	
<b>Exc-Eu-4</b>	<b>W<sub>0</sub></b>	2.252	2.254	2.256	2.264	2.259	88.67±0.95
	<b>W<sub>1</sub></b>	0.271	0.235	0.280	0.261	0.232	

**W<sub>0</sub>**: the weight of the hydrogels before drying;

**W<sub>1</sub>**: the weight of the hydrogels at the dry state.