

**Bone marrow-inspired hydrogel/graphene composite scaffolds to support *in vitro* expansion of hematopoietic stem cells**

*Jing Hong,<sup>abc</sup> Zhanchi Zhu,<sup>abc</sup> Leisha Cui,<sup>abc</sup> Zhaojun Wang,<sup>ab</sup> Ying Hao,<sup>\*abc</sup> Xiaopeng Tian,<sup>\*de</sup> Guosheng Cheng<sup>\*abc</sup>*

<sup>a</sup> School of Nano-Tech and Nano Bionics, University of Science and Technology of China, Hefei 230026, China

E-mail: [yhao2017@sinano.ac.cn](mailto:yhao2017@sinano.ac.cn); [gscheng2006@sinano.ac.cn](mailto:gscheng2006@sinano.ac.cn)

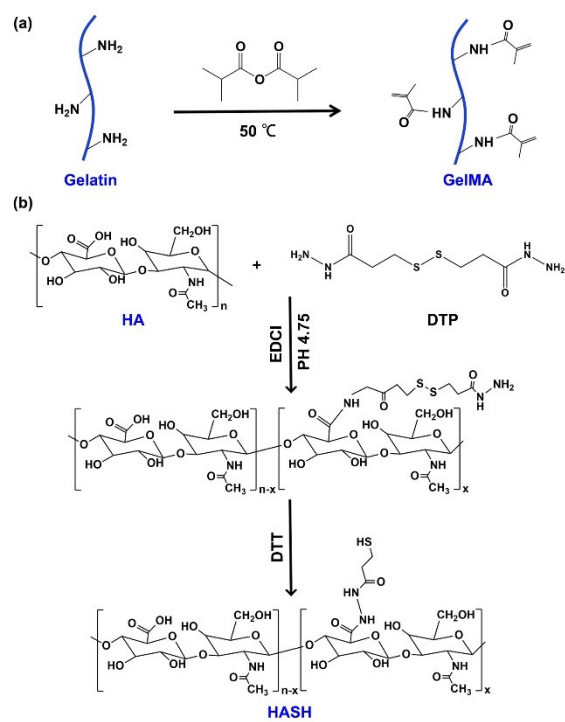
<sup>b</sup> CAS Key Laboratory of Nano-Bio Interface, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou 215123, China

<sup>c</sup> Guangdong Institute of Semiconductor Micro-Nano Manufacturing Technology, Foshan 528200, China

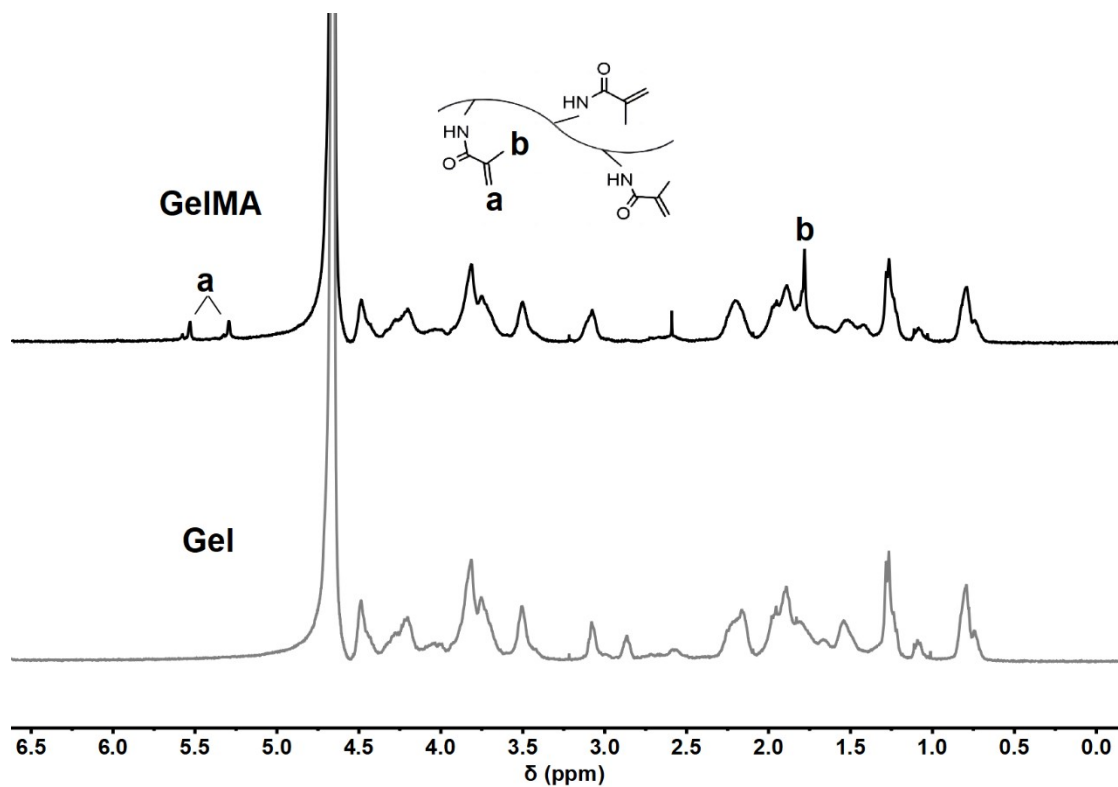
<sup>d</sup> National Clinical Research Center for Hematologic Diseases, Jiangsu Institute of Hematology, The First Affiliated Hospital of Soochow University, Suzhou 215006, China

E-mail: [txpchina@163.com](mailto:txpchina@163.com)

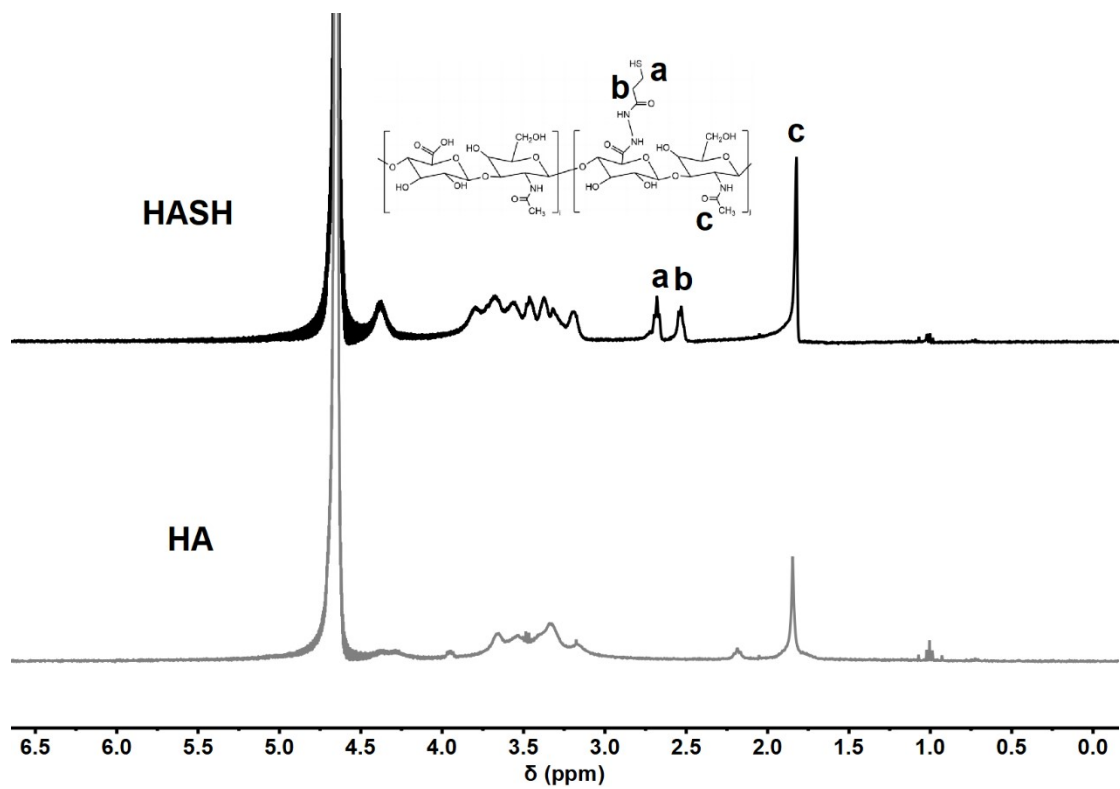
<sup>e</sup> Institute of Blood and Marrow Transplantation, Collaborative Innovation Center of Hematology, Soochow University, Suzhou 215006, China



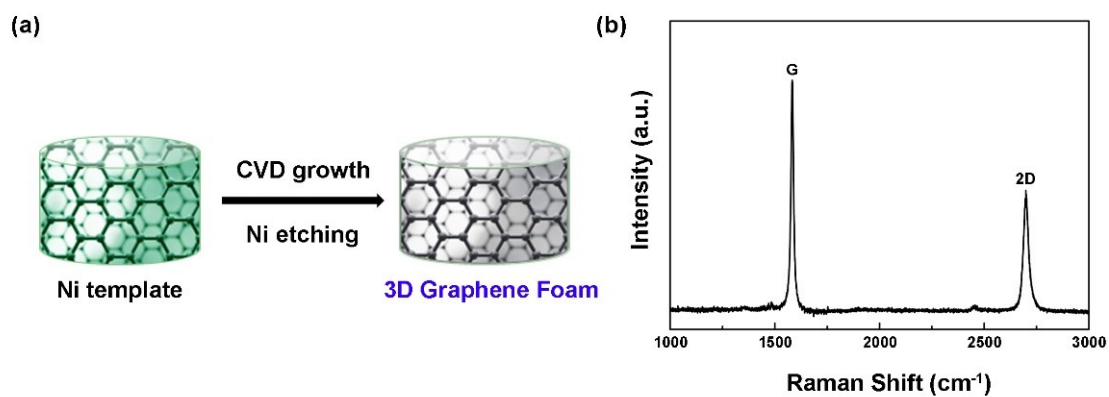
**Fig. S 1** Synthesis route of GelMA (a) and HASH (b).



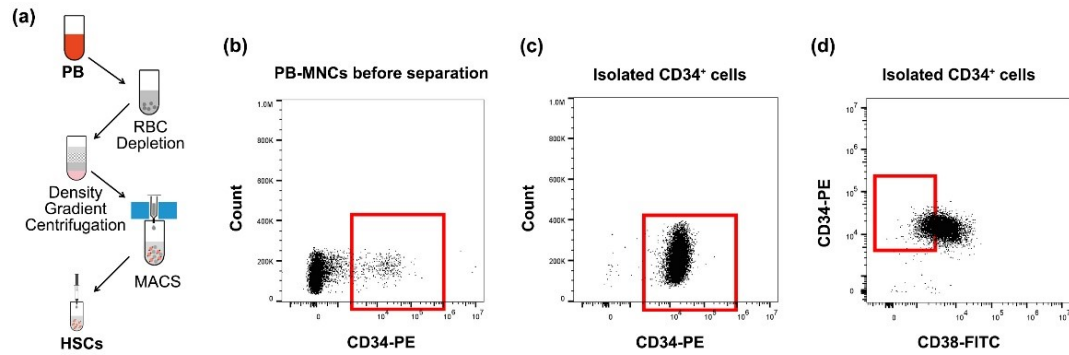
**Fig. S 2**  $^1\text{H}$  NMR spectra of GelMA and Gel.



**Fig. S 3**  $^1\text{H}$  NMR spectra of HASH and HA.



**Fig. S 4** (a) Template-assisted CVD preparation of graphene foam; (b) Typical Raman spectra acquired on the GF surface.



**Fig. S 5** Extraction and purity determination of CD34<sup>+</sup> cells. (a) Immunomagnetic bead extraction of human peripheral blood HSCs. Flowgram of CD34<sup>+</sup> cells purity percentage before (b) and after (c) extraction. (d) The percentage of CD34<sup>+</sup>CD38<sup>-</sup> cells in the isolated CD34<sup>+</sup> cells.

**Table S1.** The specific sequences of primers

Target genes	Sequence
<b>Ki67</b>	F: ACGCCTGGTACTATCAAAAGG R: CAGACCCATTTACTTGTGTTGGA
<b>CXCR4</b>	F: TGAACCCCATCCTCTATGCTT R: GATGAATGTCCACCTCGCTTT
<b>HOXB4</b>	F: CCTGGATGCGCAAAGTTCA R: AATTCCTTCTCCAGCTCCAAGA
<b>VLA-4</b>	F: AGCCCTAATGGAGAACCTTGT R: CCAGTGGGGAGCTTATTTTCAT
<b>VLA-5</b>	F: CAGATCCTCAGCAAGAATCTC R: CGTAACTCTGGTCACATATAGG
<b>GAPDH</b>	F: AGGTCGGTGTGAACGGATTTG R: TGTAGACCATGTAGTTGAGGTCA