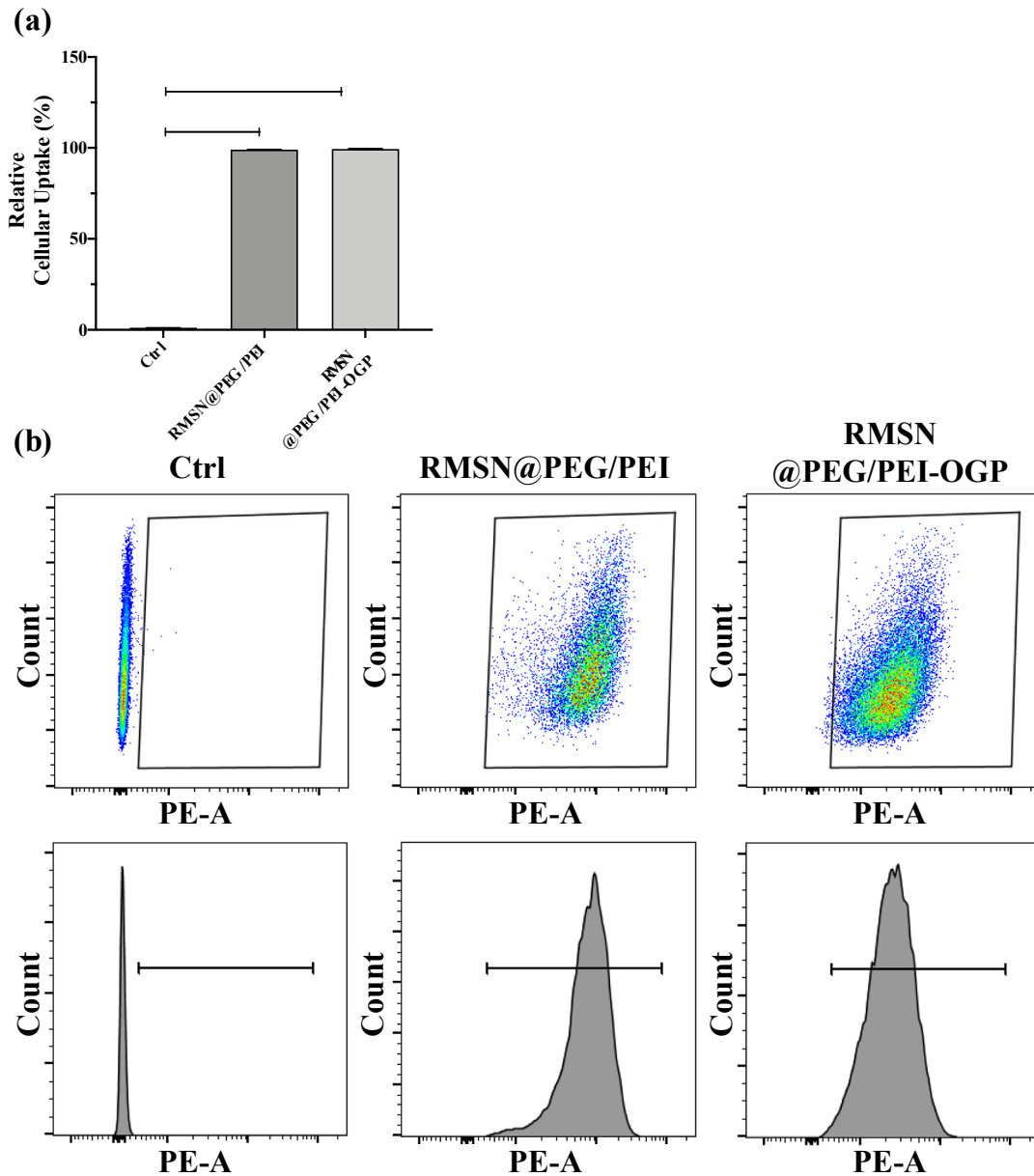


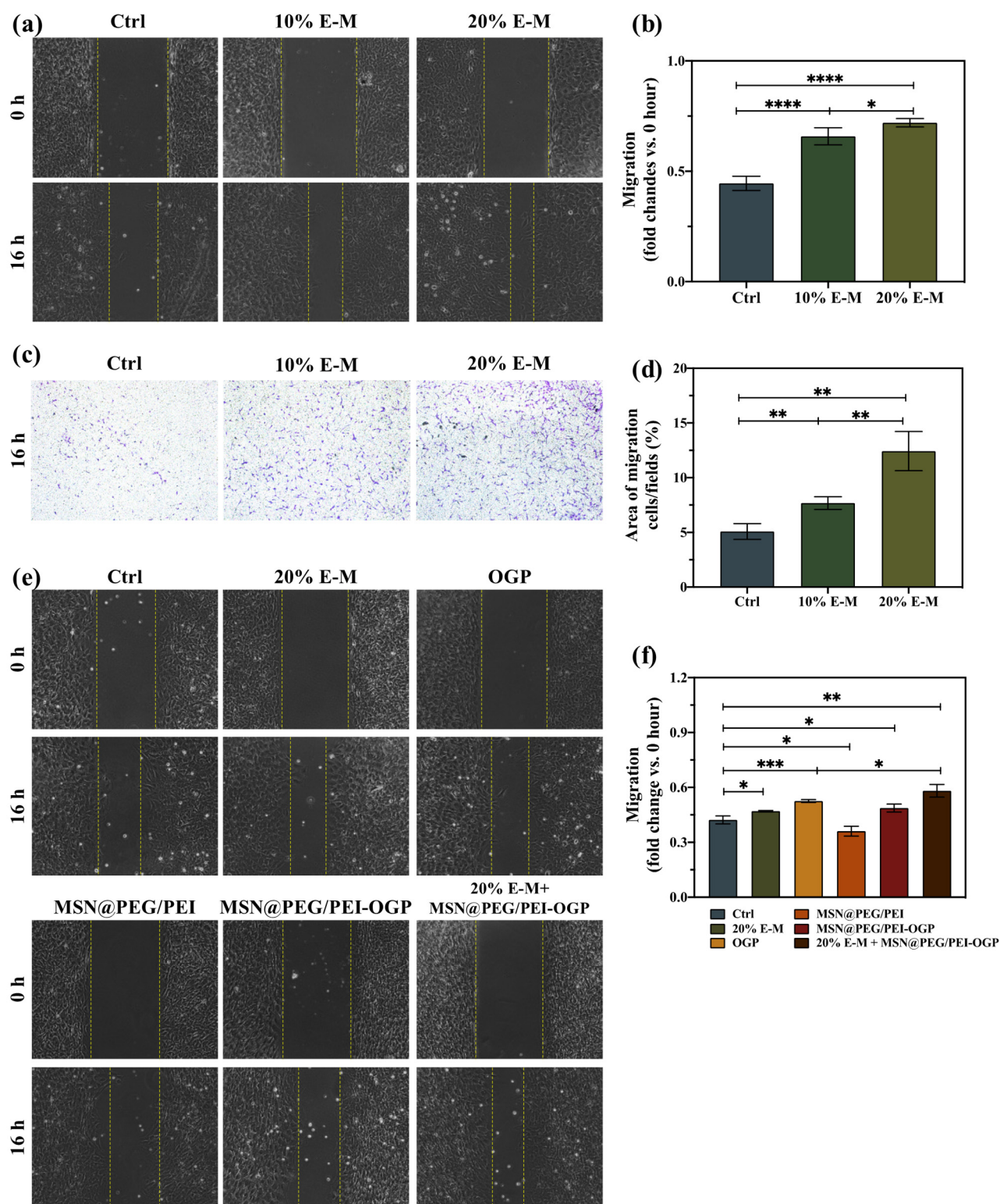
## Supplementary Materials

# Combining Mg-Zn-Ca Bulk Metallic Glass with a Mesoporous Silica Nanocomposite for Bone Tissue Engineering

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**Supplementary Figure S1.** (A) Flow cytometric analysis and (B) the quantitative chart of flow cytometry analysis of MC3T3-E1 cells at 24 h post-treatment with nanoparticles. The amount of nanoparticles were 50  $\mu\text{g/mL}$ . (n=3 per group) [Data are mean  $\pm$  S.D., \*\*\*\*  $p < 0.0001$ ].



**Supplementary Figure S2.** (A) The morphology of MC3T3-E1 cells in wound healing assay with different ratio of extracted- $\alpha$ MEM. (B) The transwell assay of different concentration of extracted- $\alpha$ MEM. (C) The morphology of MC3T3-E1 cells at 24 h post-treatment with different condition of wound healing assay. The quantitative chart of (D) wound healing assay and (E) transwell assay with different ratio of extracted- $\alpha$ MEM. (F) The quantitative chart of post-treatment with different condition

of wound healing assay. The amount of nanoparticles were 100 µg/mL. (n=3 per group). [Data are mean ± S.D., \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , \*\*\*\*  $p < 0.0001$ ].

**Supplementary Table S1.** DLS measurements of MSNs. (n=3 per group). [Data are mean ± S.D.].

Sample	Z-average (d.nm) / PDI	
	D <sub>h</sub> in PBS	D <sub>h</sub> in Water
MSN@PEG/PEI	91.66 ± 0.707 / 0.094	83.62 ± 1.511 / 0.104
MSN@PEG/PEI-OGP	107.8 ± 1.054 / 0.124	100.3 ± 1.059 / 0.100

**Supplementary Table S2.** Complete blood count of the rabbits implanted treated with different condition after 4 weeks post-surgery. (n=3 per group). [Data are mean ± S.D.].

Item	References	Mg <sub>66</sub> Zn <sub>29</sub> Ca <sub>5</sub> BMG	Mg <sub>66</sub> Zn <sub>29</sub> Ca <sub>5</sub> BMG + MSN@PEG/PEI- OGP	Mg <sub>66</sub> Zn <sub>29</sub> Ca <sub>5</sub> BMG + OGP
Lymphocytes (LYM)	35-85% ( $3 - 9 \times 10^9$ /L)	36.57 ± 17.39 (2.53 ± 0.82)	51.43 ± 12.69 (3.00 ± 1.06)	65.77 ± 3.59 (4.94 ± 0.64 )
White Blood Cells (WBC)	$5-13 \times 10^9$ /L	7.73 ± 3.18	5.82 ± 1.21	7.55 ± 1.21
Neutrophils (NEU)	20-75%	47.63 ± 17.18	32.80 ± 8.03	23.30 ± 3.05
Monocyte (Mono)	1-4% ( $< 0.5 \times 10^9$ /L)	6.93 ± 0.58 (0.53 ± 0.2)	8.77 ± 3.48 (0.52 ± 0.27)	5.17 ± 0.74 (0.39 ± 0.10)
Eosinophils (EO)	0-4%	0.47 ± 0.55	0.93 ± 0.38	1.77 ± 0.15
Basophils (BASO)	2-7%	8.40 ± 1.90	6.07 ± 1.67	4.00 ± 0.62
Red Blood Cells (RBC)	$4-7 \times 10^{12}$ /L	5.13 ± 0.86	4.93 ± 0.45	6.26 ± 0.44
Hemoglobin (HB)	10.0-15.5 g/dl	9.67 ± 1.69	10.60 ± 1.04	13.20 ± 0.98
Mean Corpuscular Volume (MCV)	50~75 mm <sup>3</sup>	58.33 ± 0.81	67.03 ± 1.50	66.47 ± 1.54
Platelets (PLT) ×	$250-270 \times 10^3$ /mm <sup>3</sup>	308.67 ± 135.49	244.33 ± 57.07	223.67 ± 53.98

**Supplementary Table S3.** Serum biochemistry of the rabbits treated with different condition after 4 weeks post-surgery. (n=3 per group). [Data are mean  $\pm$  S.D.].

Item	References	Mg <sub>66</sub> Zn <sub>29</sub> Ca <sub>5</sub> BMG	Mg <sub>66</sub> Zn <sub>29</sub> Ca <sub>5</sub> BMG + MSN@PEG/PEI-OGP	Mg <sub>66</sub> Zn <sub>29</sub> Ca <sub>5</sub> BMG + OGP
<b>Creatinine (CREA)</b>	<b>0.8-1.8 mg/dL</b>	0.73 $\pm$ 0.35	0.87 $\pm$ 0.12	1.13 $\pm$ 0.06
<b>Blood Urea Nitrogen (BUN)</b>	<b>10-24 mg/dL</b>	18.00 $\pm$ 8.19	17.00 $\pm$ 6.24	17.67 $\pm$ 4.16
<b>Total Bilirubin (TBIL)</b>	<b>0.3-0.8 mg/dL</b>	0.27 $\pm$ 0.21	0.23 $\pm$ 0.15	0.17 $\pm$ 0.12
<b>Albumin (ALB)</b>	<b>2.7-4.6 g/dL</b>	2.57 $\pm$ 0.32	3.00 $\pm$ 0.30	3.03 $\pm$ 0.15
<b>Alanine Aminotransferase (ALT)</b>	<b>31-53 U/L</b>	61.33 $\pm$ 23.18	54.00 $\pm$ 7.55	44.00 $\pm$ 11.27
<b>Alkaline Phosphatase (ALKP)</b>	<b>70-145 U/L</b>	39.67 $\pm$ 16.29	44.76 $\pm$ 4.73	58.00 $\pm$ 10.15
<b>Magnesium (Mg)</b>	<b>1.95-2.9 mg/dL</b>	3.29 $\pm$ 0.73	2.28 $\pm$ 0.46	2.56 $\pm$ 0.03