# Supporting Information for

## Controlled release of vancomycin from 3D porous graphene-based composites for dual-purpose treatment of infected bone defect

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This PDF file includes:

**Supporting Information Notes**

Verification of the rabbit infected bone defect model was conducted based on the WBC and CRP variation, wound observation, X-ray photograph and histological changes. Three rabbits of each group were randomly euthanized at 2 weeks after the modelling surgery, and the bone tissue slices were retrieved and fixed in 4% paraformaldehyde, dehydrated in a gradient series of ethanol solutions (70%, 75%, 80%, 85%, 90%, 95%, 100%) for 24 h, and embedded in polymethylmethacrylate. Serial sagittal sections with a thickness of 100 μm were obtained using a microtome (EXAKT310, Germany) and then polished to a thickness of approximately 40 μm. The sections of undecalcified specimens were then subjected to haematoxylin and eosin (H&E) staining for observation. Other harvest bone splices were soaked in PBS, and the resulting suspension was added to the agar plate, cultured overnight for observation of bacteria colony formation.

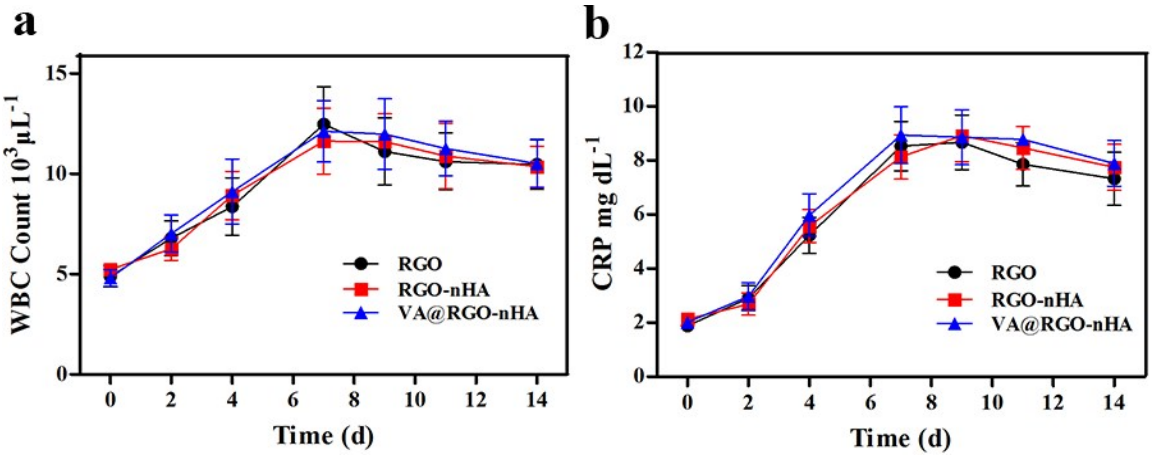


**Fig. S1** Obviously increased infection indicators of rabbits underwent modelling surgery in group RGO, RGO-nHA and VA@RGO-nHA. (a) Changes in WBC count. (b) Changes of CRP level after modelling surgery.

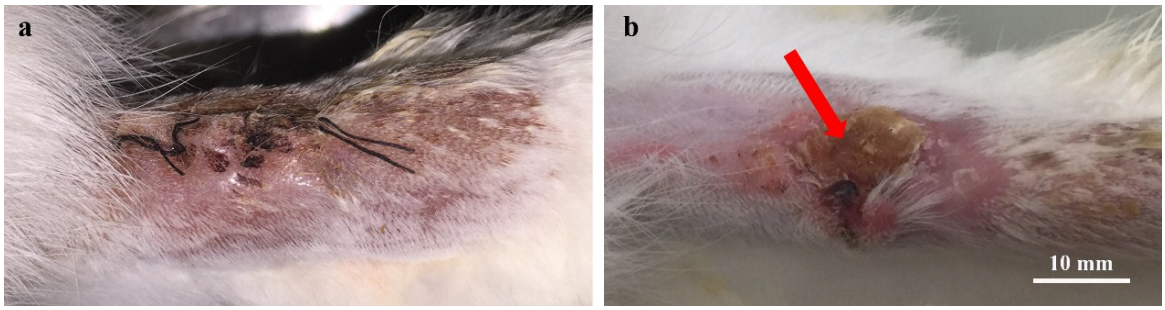


**Fig. S2** Digital photographs of rabbit forearms after modelling surgery. (a) 1 week after modelling surgery, swelling of the wound was observed due to established infection and inflamation. (b) 2 weeks after modelling surgery, more obvious symptoms was observed with soft tissue ulceration and fester from the open wound. Red arrow indicates ulcerated soft tissue and abscess pyogenic fluids.

**Fig. S3** Bacterial culture of the harvested bone marrow from the rabbit models revealed massive *S. aureus* bacterial colony formation on the agar plate.

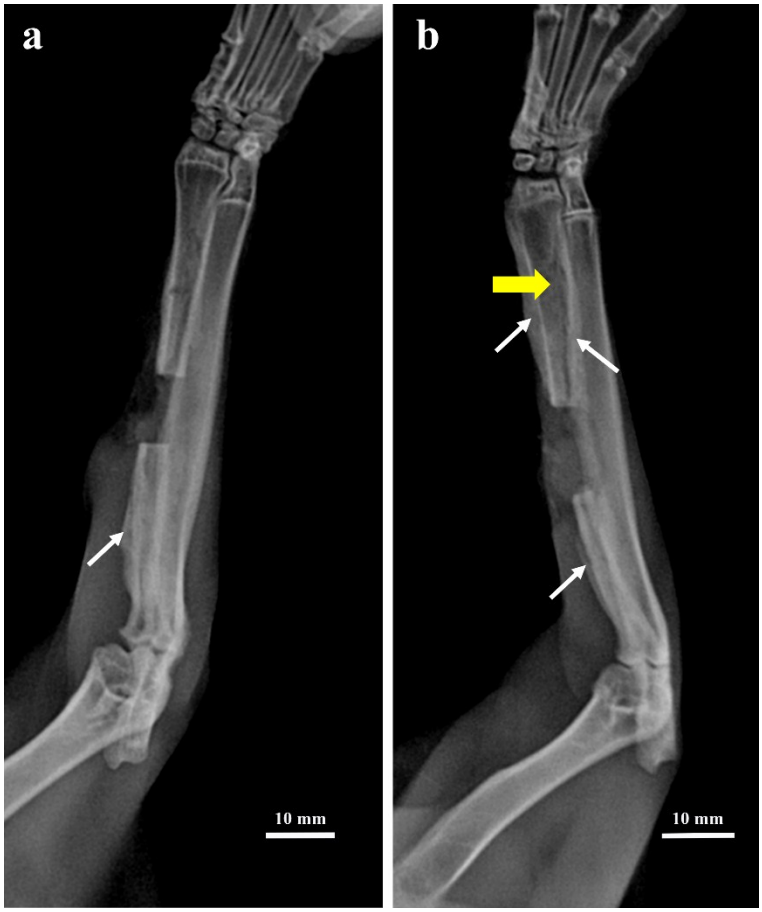


**Fig. S4** X-ray photographs of the rabbit forearms (a) 1 week after modelling surgery and (b) 2 weeks after modelling surgery. White arrows indicate thickened periosteal reaction and sequestrum due to inflammatory response, and yellow arrows indicate disorganized and inflammatory bone marrow due to infection.

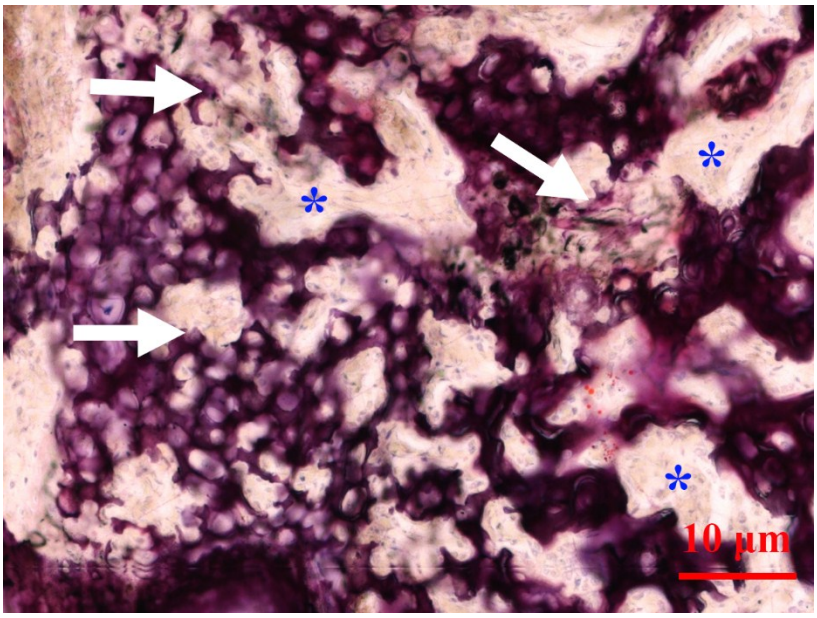


**Fig. S5** H&E staining of undecalcificated bones slices from the rabbit models demonstrated inflamation and bone destruction due to bacteria propagation. Asterisks indicates inflammation cells infiltration, and bold arrows indicates leisions of the affected bone trabecula.Scale bar = 10 μm.