

Supplementary Information

Graphene: a Protection Film in Biological Environment

Weixia Zhang¹, Sudarat Lee^{1†}, Kelly L. McNear¹, Ting Fung Chung^{2,3}, Seunghyun Lee⁴, Kyunghoon Lee⁴, Scott A. Crist^{5,6}, Timothy L. Ratliff^{5,6,7}, Zhaohui Zhong⁴, Yong P. Chen^{2,3,8}, Chen Yang^{1,2,*}

¹Department of Chemistry, Purdue University, West Lafayette, Indiana 47907, United States

²Department of Physics, Purdue University, West Lafayette, Indiana 47907, United States

³Birck Nanotechnology Center, Purdue University, West Lafayette, IN, 47907, United States

⁴Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan 48109, United States

⁵Department of Comparative Pathobiology, Purdue University, West Lafayette, Indiana 47907, United States

⁶The Center for Cancer Research, Purdue University, West Lafayette, Indiana 47907, United States

⁷College of Veterinary Medicine, Purdue University, West Lafayette, Indiana 47907, United States

⁸School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana 47907, United States

[†] Current address: Department of Chemistry, University of Michigan, Ann Arbor, Michigan 48109, United States

*Corresponding Author: yang@purdue.edu

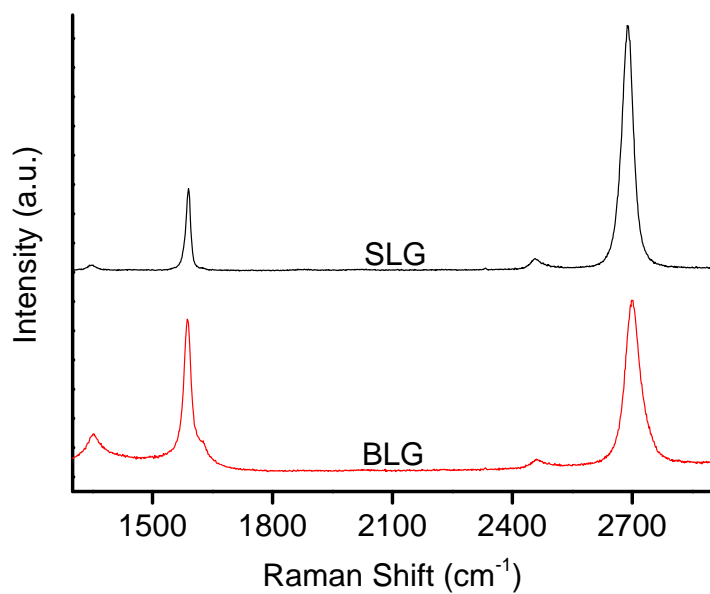


Figure S1. Representative Raman spectra taken from CVD grown single-layer graphene (black solid line) and bilayer graphene (red solid line) samples. Raman spectroscopy was performed on graphene transferred on SiO₂/Si substrates. Laser excitation wavelength is 514 nm.

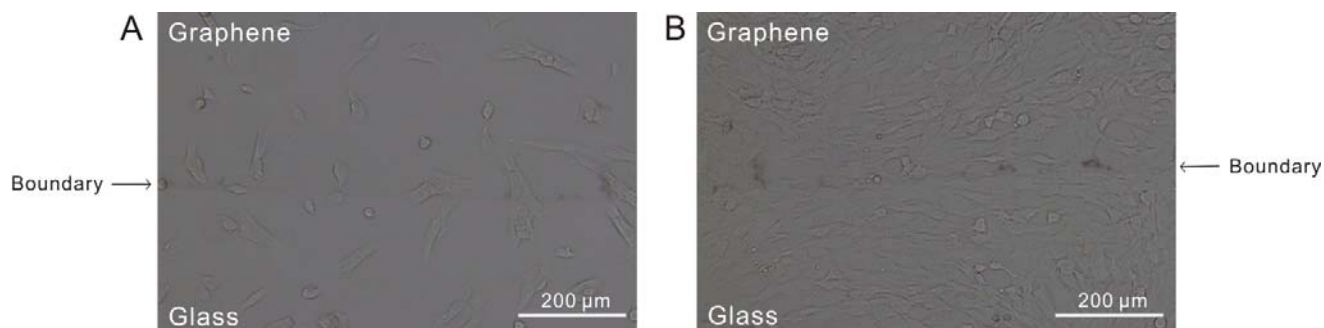


Figure S2. Optical images of MG-63 on the boundary area between graphene (top) and glass (bottom) after incubation for (A) 1 day and (B) 3 days.

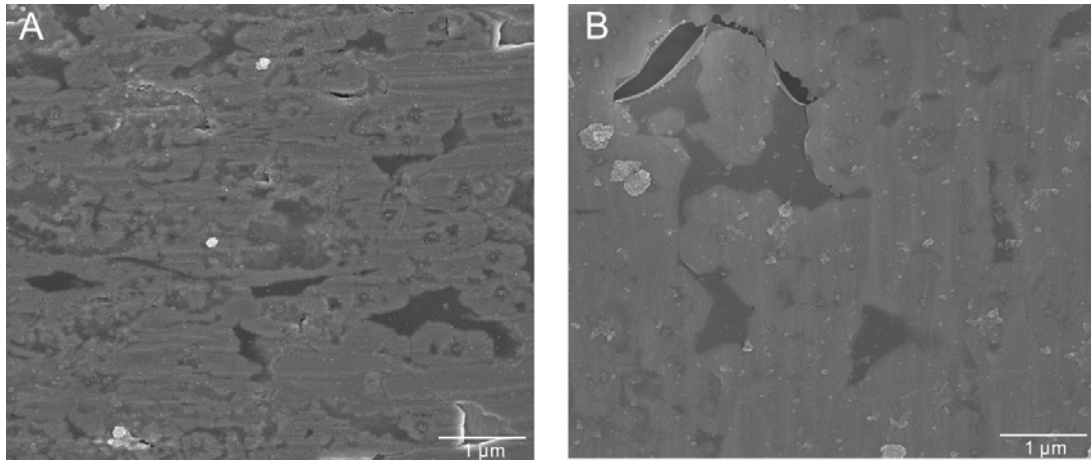


Figure S3. SEM images of (A) SLG/Cu and (B) BLG/Cu samples after incubation for 4 days.

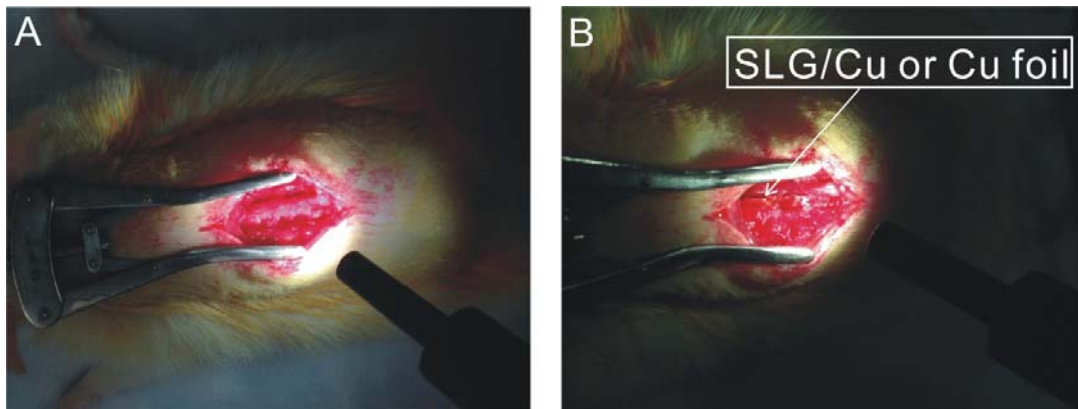


Figure S4. Optical images of (A) the exposed spine of a rat, and (B) implanted SLG/Cu or bare Cu foil with size of 1.3 cm x 0.5 cm by the spine on the left.