

Supplementary Information

Graphene oxide is degraded by neutrophils and the degradation products are non-genotoxic

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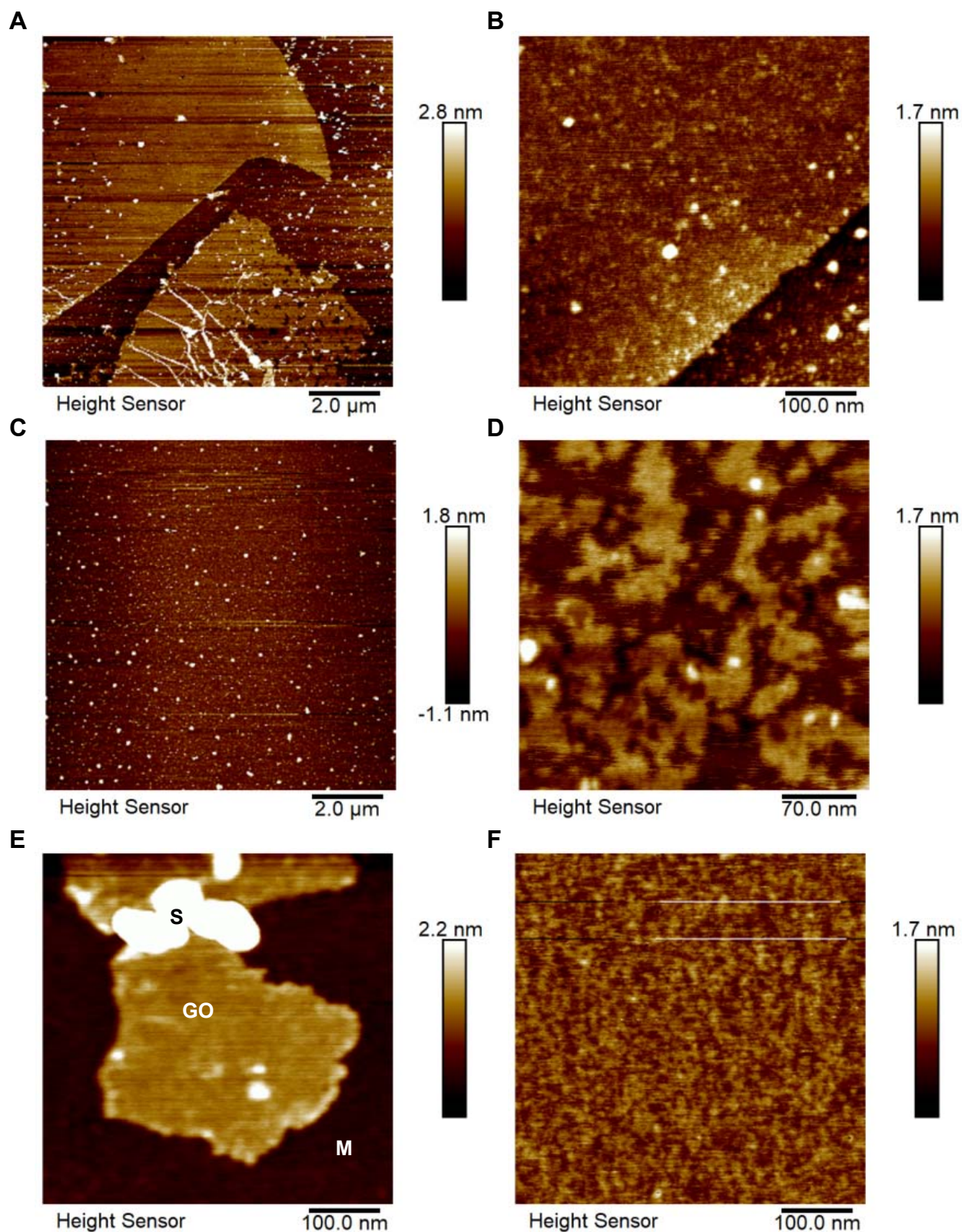


Fig. S1. AFM imaging of GO-S and GO-L. AFM images of GO samples before and after acellular biodegradation in the presence of MPO + NaCl + H₂O₂. GO-L before (a-b) and after 12 h (c-d) biodegradation. GO-S before (e) and after 12 h (f) biodegradation. Abbreviations (panel e): GO, graphene oxide; M, mica substrate; S, (probable) salt crystal.

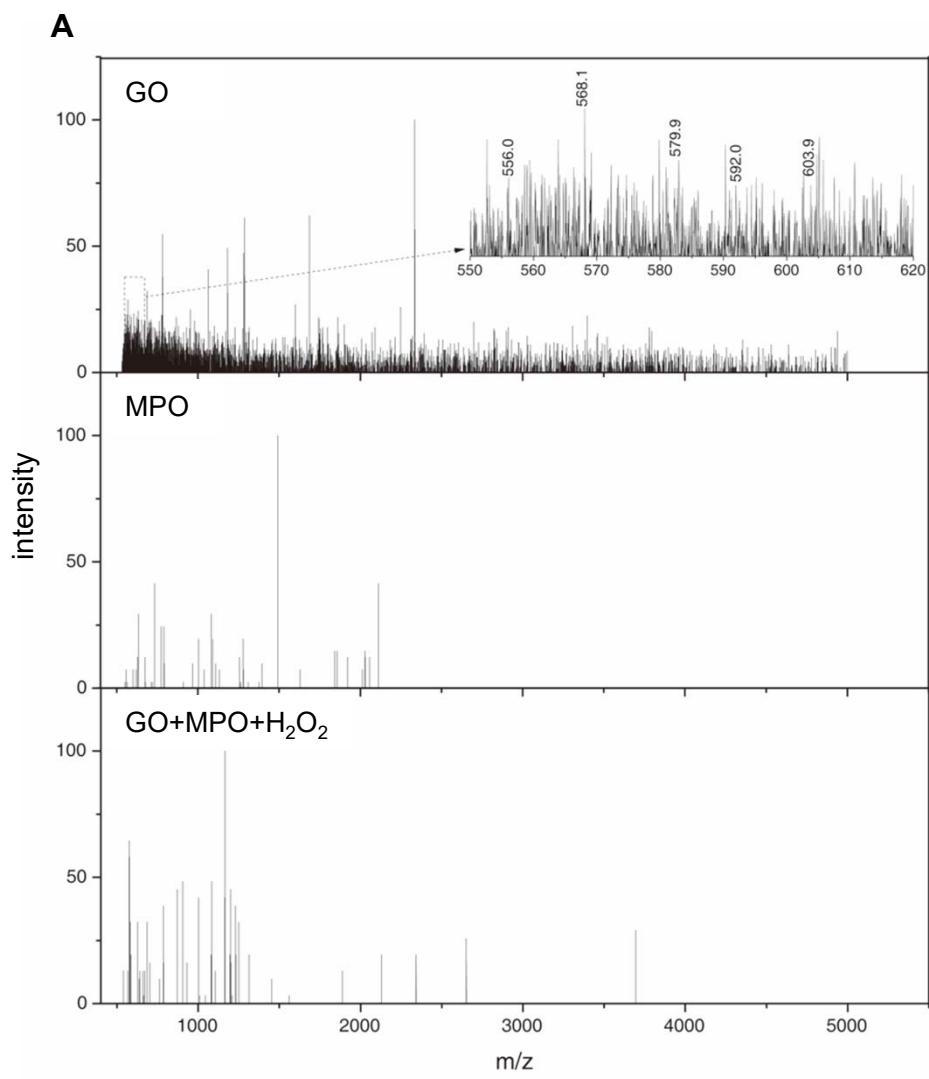


Figure S2

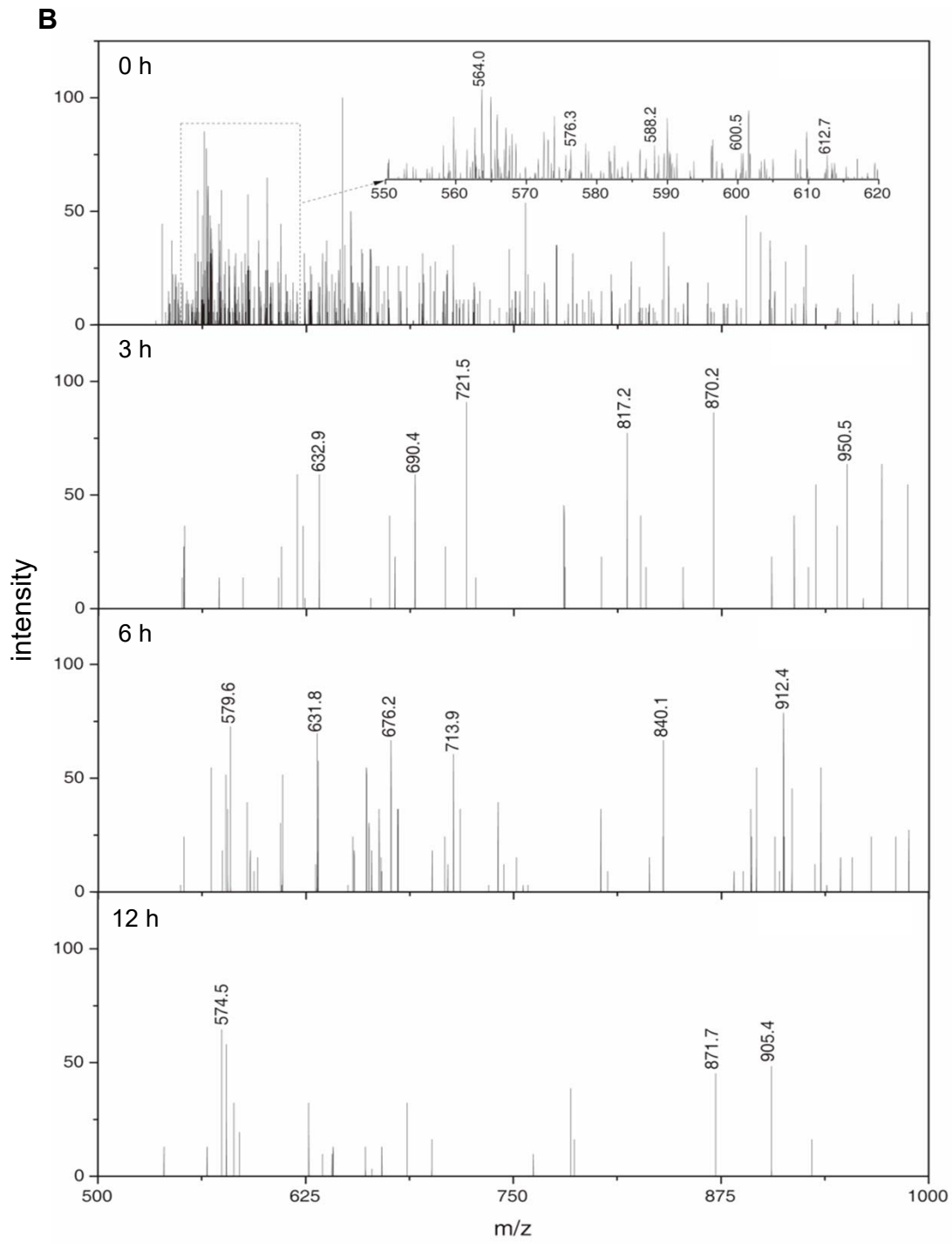


Figure S2

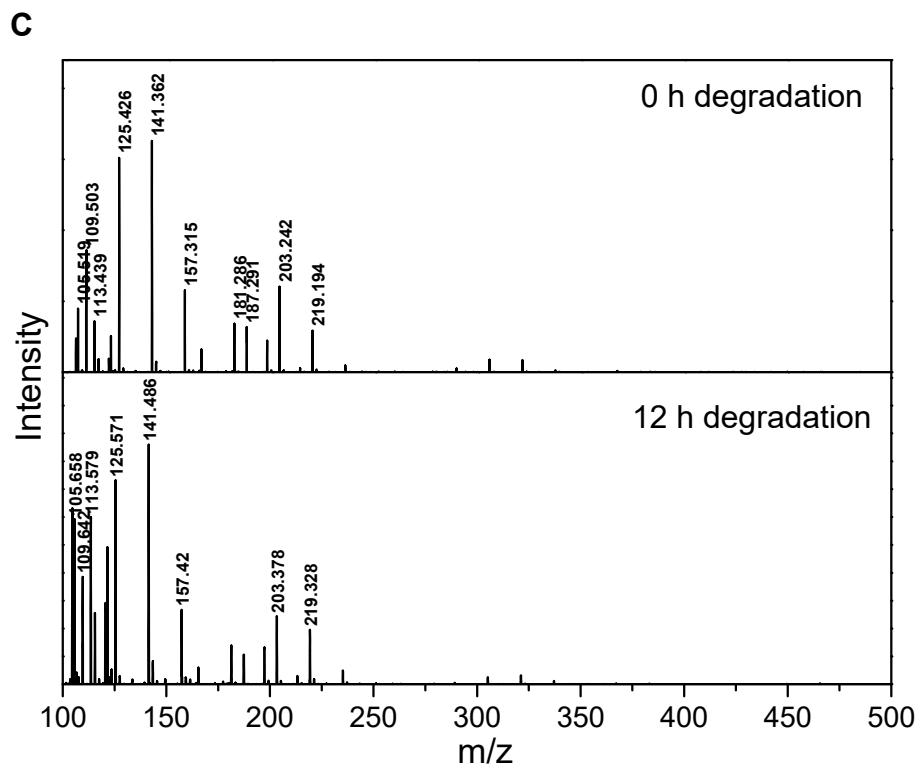


Fig. S2. Mass spectrometry of small GO sheets. (a) MALDI-TOF MS spectra of GO-S (top panel), MPO (middle panel) and GO-S incubated for 12 h in the presence of MPO and H_2O_2 (bottom panel). Inset in top panel displays zoom-in view of spectra from $m/z = 550$ to 620 . Peaks spaced by 12 Da across the mass spectra correspond to carbon atoms of GO. (b) Mass spectrometry shows breakdown of GO. GO-S was incubated with MPO + NaCl + H_2O_2 for 0-12 h and MALDI-TOF MS spectra were taken at the indicated time-points. The spectrum at 0 h revealed the presence of GO. The inset shows peaks separated by 12 Da corresponding to carbon atoms of GO. From 3 h to 12 h, GO peaks were no longer observed in the spectra. Inset in the top panel displays a zoom-in view of spectra from $m/z = 550$ to 620 . (c) MALDI-TOF spectra of 0 h (top panel) and 12 h degradation (bottom panel) samples (GO-S + MPO + NaCl + H_2O_2) in m/z range of 100-500.

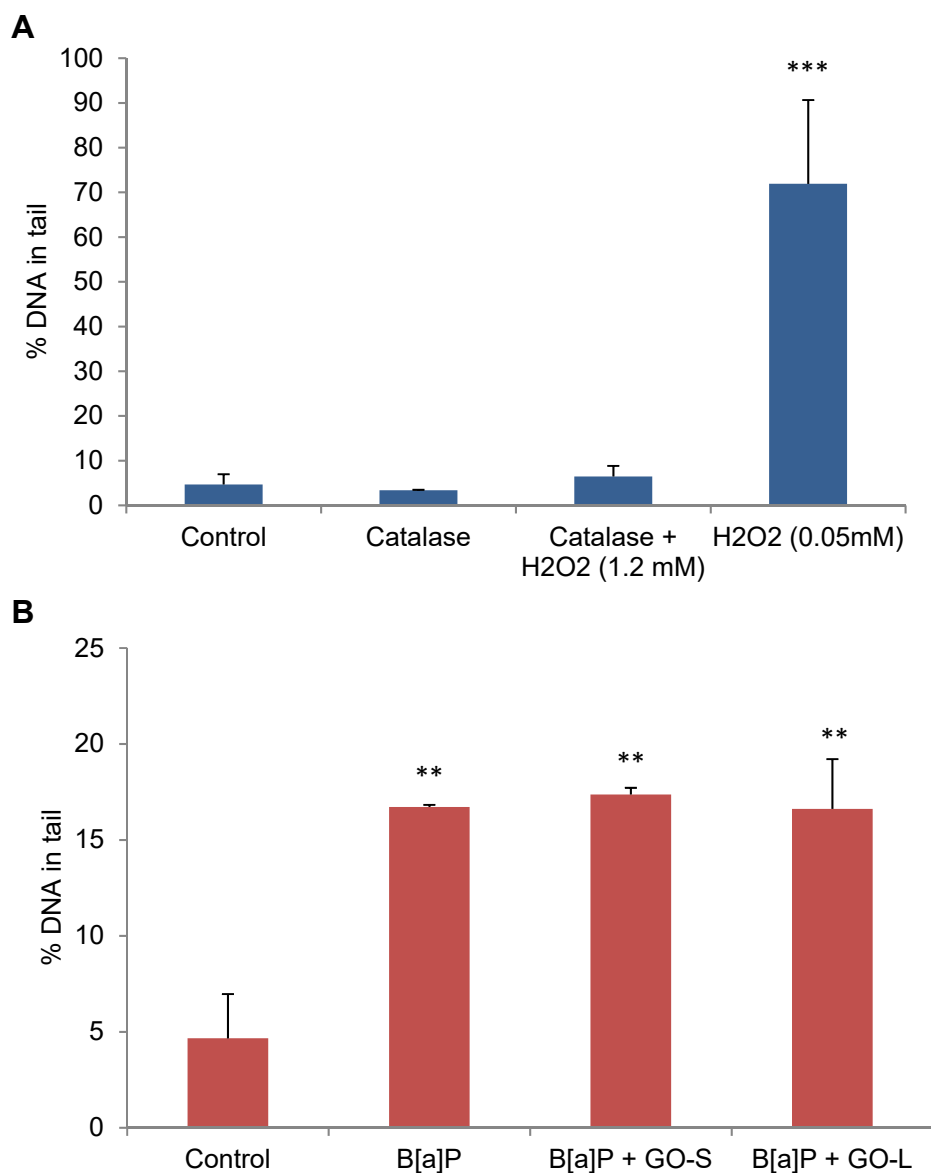


Fig. S3. Genotoxicity assessment. (a) H_2O_2 (50 μ M, 5 min exposure) was used as a positive control and was shown to trigger DNA damage in BEAS-2B cells. Catalase prevented DNA damage of 1.2 mM H_2O_2 , corresponding to the amount of H_2O_2 added to the reaction mixtures during a 12 h biodegradation experiment (refer to Figure 6). (b) B[a]P, a known carcinogen, induced DNA damage in BEAS-2B cells at 200 μ M. The addition of B[a]P to cells together with GO-S or GO-L (25 μ g/mL) did not affect the DNA damaging effect of B[a]P (200 μ M), showing that the GO sheets did not interfere with the assay.