Electronic Supplementary Material (ESI) for Nanoscale.

Peroxidase mimicking DNAZymes degrade graphene oxide

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Electronic Supplementary Information

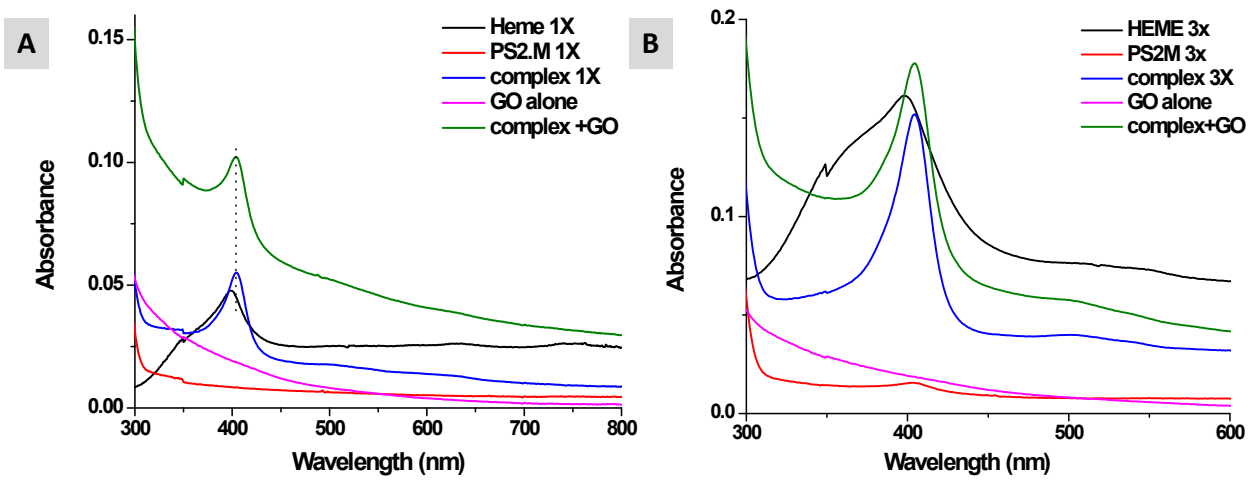

Figure S1. UV-vis absorption spectra of the PS2.M-hemin 1× complex (A) and 3× complex (B), compared to PS2.M alone, GO alone, and the complexes in the presence of GO. The spectrum of GO alone is also shown.

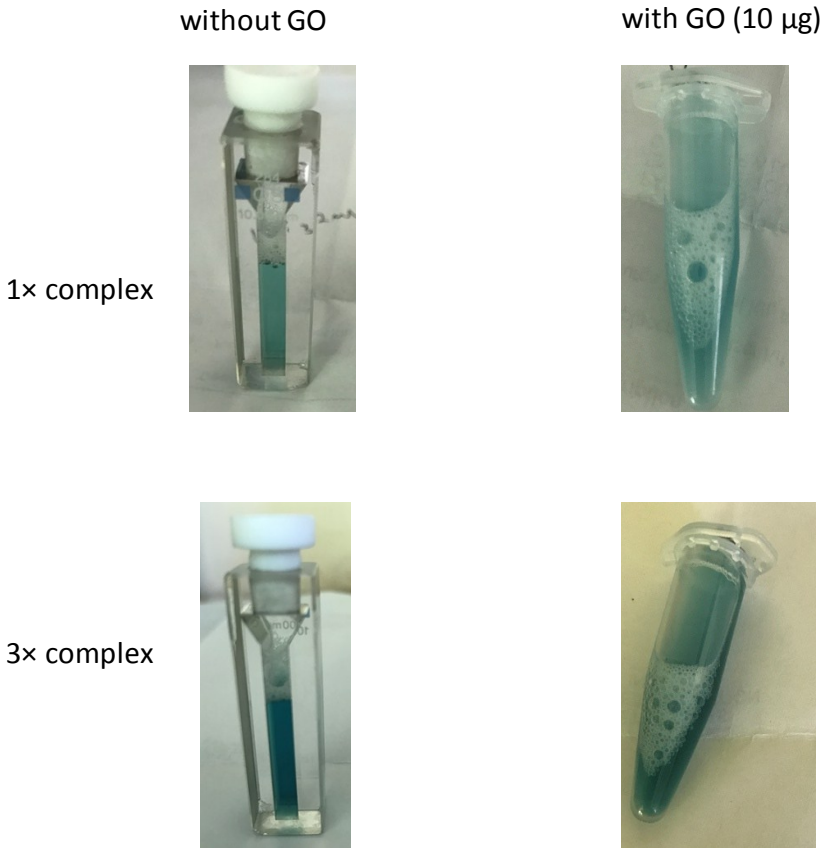

Figure S2: Peroxidase activity test using $ABTS^{2-}$. $ABTS^{2-}$ is oxidized to $ABTS^{\cdot+}$ radical cation (greenish color) by PS2.M-hemin 1× complex and 3× complex, in the presence of hydrogen peroxide. The peroxidase activity test was carried out in the presence of 10 µg GO in both complexes.

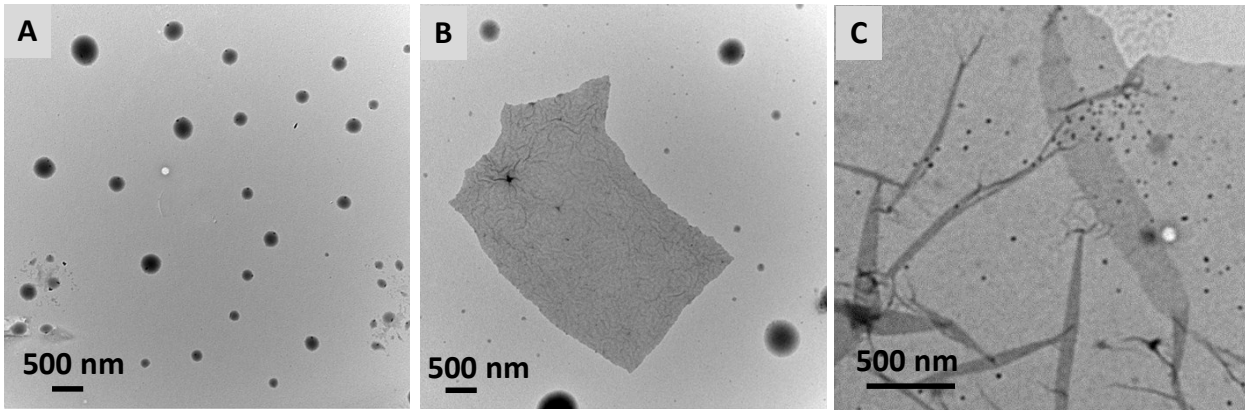

Figure S3. TEM images: (A) PS2.M-hemin 1× complex at day 0; (B) PS2.M-hemin 3× complex + GO at day 0; (C) Magnified image of (Figure 1B) PS2.M-hemin 3× complex + GO at day 0.

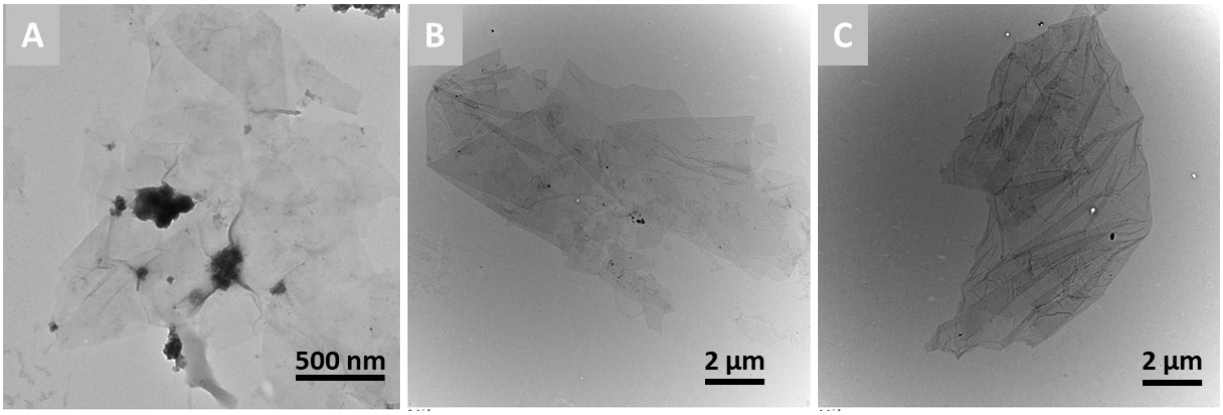

Figure S4. TEM images of control experiments using 1× complex. (A) 1× complex + GO without H_2O_2 for 30 days; (B) Hemin + GO without H_2O_2 for 30 days; and (C) GO + H_2O_2 for 30 days.

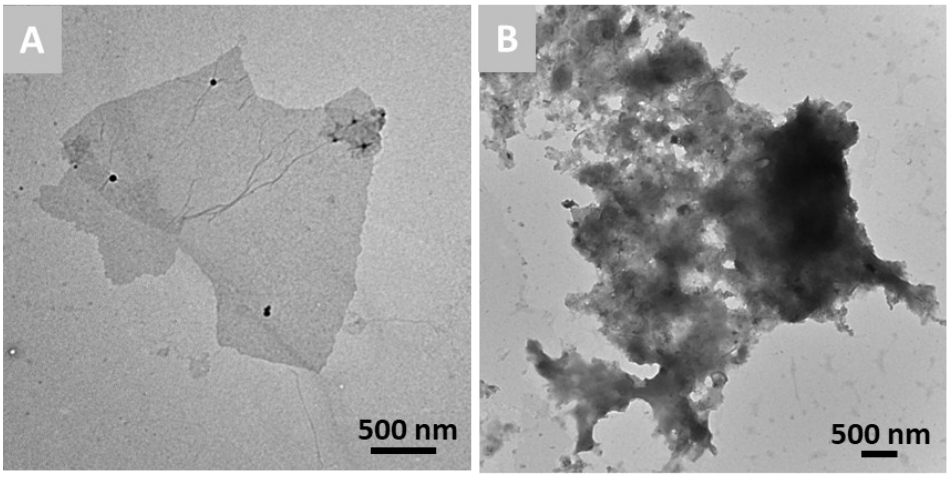

Figure S5. TEM images of control experiments using 3× complex. (A) 3× complex + GO without H_2O_2 for 30 days; and B) Hemin + GO + H_2O_2 for 30 days.

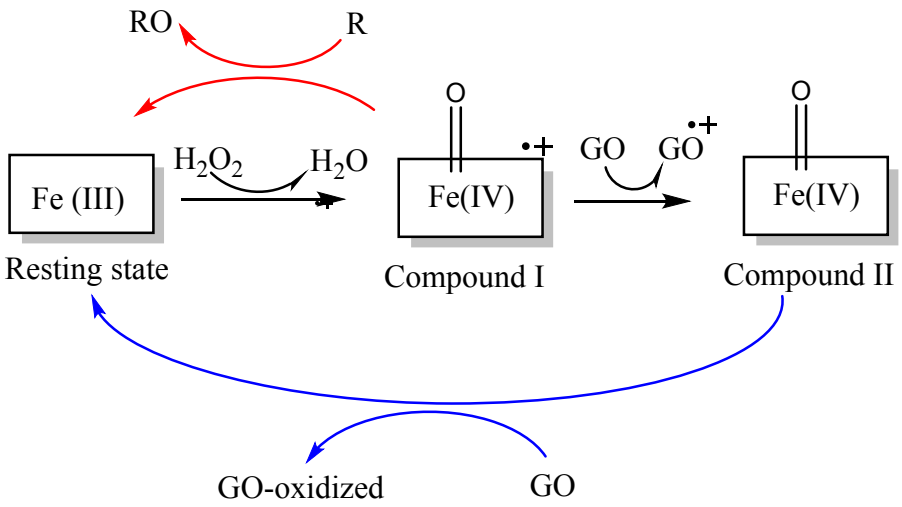

Figure S6. Two-electron oxidation mechanism catalyzed by hemin enzymes as reported earlier[1]. Red-arrows describe one-step or direct oxygen transfer oxidation mechanism.

References

1. Poon, L. C. H., Methot, S. P., Morabi-Pazooki, W., Pio, F., Bennet, A. J. & Sen, D. Guanine-rich RNAs and DNAs that bind heme robustly catalyze oxygen transfer reactions. *J. Am. Chem. Soc.* **2011**, *133*, 1877-1884.