Supporting Information

Manganese Protoporphyrin IX Reconstituted Myoglobin Capable of Epoxidation of C=C Bond with Oxone®

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**Figure S1** Kinetic studies of 30 μM His3 Mn$^{III}$Mb reacted with 20 equiv KHSO$_5$ in PBS buffer (pH=7.4). Inset: Time course plots of absorbance at 410 nm, and corresponding rate constants of Mn=O formation.
Figure S2 Kinetic studies of 30 μM F43H Mn\textsuperscript{III}Mb reacted with 200 equiv KHSO\textsubscript{5} in PBS buffer (pH=7.4).
**Figure S3** Kinetic studies of 30 μM L29H MnIII Mb reacted with 200 equiv KHSO5 in PBS buffer (pH=7.4).
Figure S4 Kinetic studies of 30 μM H64F Mn\textsuperscript{III}Mb reacted with 200 equiv KHSO\textsubscript{5} in PBS buffer (pH=7.4).
**Figure S5** Kinetic studies of 30 μM F43H/H64F MnIII Mb reacted with 200 equiv KHSO₃ in PBS buffer (pH=7.4).
Figure S6 Kinetic studies of 30 μM L29H/H64F MnIII Mb reacted with 200 equiv KHSO$_5$ in PBS buffer (pH=7.4).
Figure S7 Kinetic studies of 30 μM L29H/F43H/H64F Mn$^{III}$Mb reacted with 200 equiv KHSO$_5$ in PBS buffer (pH=7.4).
Figure S8 ESI-MS of apo His3 Mb with 20 equiv KHSO$_3$ after reacting for 3 min.
Figure S9. Retention times and peak areas of (a) oxidized and (b) unoxidized peptide HPGDFGADAQGAMNK in LC/MS. In each graph, A-D represent apo-His3 Mb with Oxone®, His3 MnIII Mb without any oxidants, His3 MnIII Mb with Oxone®, and His3 MnIII Mb with H₂O₂, respectively.
Figure S10. Fragmentation patterns of peptide from HPGDFGADAQGAM(Ox)NK the digestion of His3 Mn$^{III}$Mb reacted with KHSO$_5$. 
Figure S11. $^1$H NMR after the reaction of styrene and Oxone® catalyzed by His3 Mn$^{III}$Mb.
Figure S12. Conversion of epoxidation (red) and yield of styrene oxide (black) at different pHs. Conversion was calculated by 1-(unreacted styrene/total added styrene). Yield was based on styrene oxide generated/total added styrene.