Coenzyme dependent nanozyme playing dualroles in oxidase and reductase mimics with enhanced electron transport

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Figure s1. SEM images of ZIF (a) and PEI/ZIF (b).



Figure s2. FTIR spectra of ZIF and PEI/ZIF.



Figure s3. UV-Vis absorption spectra (a) and photoexcitation spectra (b)

of FMN and FAD.



Figure s4. UV-Vis absorption spectra of FMN in the presence of

different substances.



Figure s5. FTIR spectra of FMN, FAD, PEI/ZIF-FAD and PEI/ZIF-FMN in different wavelength ranges.



Figure s6. UV-Vis absorption spectra of FMN, FAD, ZIF-FMN, ZIF-FAD, and ZIF.



Figure s7. (a) XRD patterns of ZIF-FAD and ZIF-FMN. (b) XRD

patterns of PEI/ZIF-FAD and PEI/ZIF-FMN.



Figure s8. (a) Schematic representation of PEI/ZIF etching by high concentration of FMN. (b) TEM and (c) SEM imaging of PEI/ZIF after FMN etching.



Figure s9. Zn 2p XPS spectra of ZIF-FMN, ZIF, PEI/ZIF-FMN and PEI/ZIF.



Figure s10. Confocal laser scanning micrographs images of PEI/ZIF-FMN.



Figure s11. Confocal laser scanning micrographs images of ZIF-FMN.



Figure s12. UV-Vis absorption spectra of NADH in the presence (a) or absence (b) of PEI/ZIF-FMN.



Figure s13. UV-Vis absorption spectra of reaction mixtures containing 100 μ M of NADH and different concentrations of PEI/ZIF-FMN after colorimetric assays by using HRP and TMB.



Figure s14. Comparison of NADH oxidase like properties of different catalysts. The UV-Vis absorption spectra of reaction mixtures after added HRP and TMB.



Figure s15. The UV-Vis absorption spectra of PEI/ZIF-FMN before and after react with NADH.



Figure s16. Catalytic activity of PEI/ZIF-FMN nanozyme before and after stored at 4 °C for 30 days. The concentrations of PEI/ZIF-FMN and NADH were 200 μ g mL⁻¹ and 100 μ M, respectively.



Figure s17. Reusability of PEI/ZIF-FMN for NADH oxidation reaction.



Figure s18. XRD patterns of PEI/ZIF-FMN after recyclable uses.



Figure s19. SEM and TEM images of PEI/ZIF-FMN after recyclable

uses.



Figure s20. (a) UV-Vis absorption of PEI/ZIF-FMN at 450 nm after recyclable uses. (b) UV-Vis absorption of PEI/ZIF-FAD at 450 nm after recyclable uses.



Figure s21. UV-Vis absorption spectra of Cyt c in the absence (a) and presence (b) of NADH.



NADH and different concentrations of Cyt c. (b) Lineweaver-Burk plots obtained from Figure s15a. (c) Steady-state kinetic assay in the presence

of 20 μ M Cyt c and diferent concentrations of NADH.